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DEPARTMENT OF AGRICULTURE
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DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

The Agricultural Gazette

of Canada

EDITOR: J. B. SPENCER, B.S.A.

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The Agricultural Gazette

OF CANADA

VOL. V MAY, 1918 No. 5

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PROGRESS OF CO-OPERATION

AN attempt has been made in this issue of THE AGRICULTURAL GAZETTE, with a series of reports from a variety of associations formed for co-operative purposes, to indicate how greatly the system has progressed in recent years, and to show to some extent its scope, aims, and objects.

There is naturally a unity, or commonness, of purpose in every organization. Each exists primarily for the uplifting and benefitting of the members, but together they have a wider mission. The prompting desire is by organization and co-operation to advantage themselves, but once united a deeper and a wider meaning is apparent in the movement, and that is the placing on a higher plane the basic industry of Canada.

Without the organization that co-operation implies this country cannot hope to rival, or to successfully compete against, or with, other nations.

Co-operation means system. Co-operation means capital. Without both, Canada can never take her place in the marts of the agricultural and industrial world that her vast producing resources entitle her to.

Yet a few years ago co-operation among farmers in a business sense was almost an unknown quantity. Organizations and associations existed, but their motives, although partially of an economic nature, were as much the attainment of collective influence as the betterment of the trade and business prospects of the members.

Co-operation fills a sphere, and establishes a medium, that those associations and societies barely touched, and, at the same time, embodies practically all that they represented.

The articles published in this number of THE GAZETTE, without being either didactic or statistic, are illuminative of the immense strides that co-operation has made, and is making, among the agricultural community. As an example of this, it can be here stated that in the province of Saskatchewan alone, the number of co-operative societies increased from 102 in 1914 with a membership of 2,850, a paid up capital of $13,494.20, and assets of $37,337.55, to 309 associations with 9,444 members, $92,940.27 paid up capital, and assets of $295,012.40, in 1916. By May, 1917, the associations had further increased to 367. Similar, or proportionate, progress is reported in every other province.

In earlier issues of THE GAZETTE, the steps that have been taken in the co-operative marketing of wool, of poultry, of dairy products, and other lines of the agricultural industry, have been chronicled, but in this number it is sought to mirror the more intimate form of transactions in farm requirements.

WHAT THE PROVINCES ARE DOING

THE Honourable Mr. Crerar, Minister of Agriculture, in the House of Commons on March 27th, gave the following summary of what the provinces are doing, concluding with some suggestions as to the necessity that is with us to produce and save:

Commencing with the provinces by the sea, Nova Scotia has set itself a fine objective this year. It is going to produce enough wheat and coarse grain to supply its demands, whereas every other year it has imported. The province of New Brunswick is in the same position. In the province of Quebec, where ordinarily they produce about a million bushels of wheat and consume about twelve million bushels, they are aiming this year—and the provincial authorities tell me they expect to realize that aim—to produce enough wheat to feed themselves, which will release ten or eleven million bushels of wheat to go overseas. Ontario will also increase its wheat production. In the western provinces we will have, I venture to say, the largest acreage that we have ever had in respect to grain production, and, if we are only favoured with a good season, we will probably have the largest crop of wheat that the West has ever had. But I want to impress this fact upon our people: in order to get these results in the different provinces, in order to supply the help that is necessary to make up the deficiency in labour, we must have recourse to organization, and you cannot do that unless you get men, and if you get the men you have got to pay them.

I want to make one other observation before I close, and it is this, the people of Canada have not been as economical as they should have been in the past; I think we have been rather an extravagant people. Today we are driving home to the people of the Dominion, through the educational work carried on under the auspices of the Food Board, the great need of thrift and of saving. I hope, in fact I am sure, the effort will bear fruit in the future. There is no disguising the fact that we shall have to face very heavy burdens after this war is over. We can only successfully meet those heavy burdens by encouraging in every way possible the principles of thrift among our people. We have got to produce, but, above everything, we must save; and today the educational work that is being carried on by the bulletins that my hon. friend, the member for Wright, alluded to, and carried on through the medium of addresses, through moving picture shows and pictures thrown on the screens, and meetings held throughout the country, and utilizing every agency that can be utilized, is driving home to our whole people this principle of thrift, this need of saving, and they are realizing today, as they have never realized in the past, what can be done by a little effort in the way of saving, the conserving of food supplies, and the conserving of everything.

SOLDIERS' SETTLEMENT LOAN REGULATIONS

THE Soldiers' Settlement Loan Regulations adopted by Order in Council, under authority of the Soldier Settlement Act, 1917, were announced on the 5th day of April, 1918. The regulations provide that loans may be granted to any person who has served in the naval or military expeditionary forces during the present war and who has left the forces with an honourable record, and any person who has been engaged in active service during the present war in the naval or military forces of the United Kingdom, or of any of the self-governing British Dominions or Colonies, and who left with an honourable record; also any British subject resident in Canada before the war, who has been engaged in active service in either the naval or military forces with an honourable record, and, finally, the widow of any man who died on active service.

The loan, which must not exceed $2,500, is to be used for acquiring

land for agricultural purposes; the payment of encumbrances on lands used for agricultural purposes; the improvement of agricultural lands; the erection of farm buildings; the purchase of stock, machinery, equipment and such other purposes as may be approved. Applicants will be required to give complete information about themselves and regarding the land it is contemplated to farm. Application must be made to the local representative of the Soldiers' Settlement Board, and an inspector will be appointed to visit the land for which the loan is desired. In the provinces of Manitoba, Saskatchewan and Alberta, and in the railway belt of British Columbia, the agents of Dominion Lands are to act as local representatives until otherwise decided by the Board.

The amount of a loan will depend on the security the applicant can give. Loans must be secured and cannot be made upon a lease-hold estate or other limited title. No patent can issue for Dominion lands on which a loan has been raised until the loan with interest at 5 per cent has been paid in full. Persons who have obtained a loan for less than the maximum amount permitted by the Act, and who are in good standing in the matter of payments of principal and interest, can apply for a second or subsequent loan.

Settlers must commence to improve and work the land on which the loan is granted without loss of time, and must fulfil the cultivation and residence duties prescribed by the Act. All loans are to bear interest at the rate of 5 per cent per annum. Repayment is to be made in equal annual instalments extending over a period of not more than twenty years. The Board can defer the payment of the whole, or part, of the first two instalments to a later date if deemed expedient. Settlers can pay up at any time with interest to the date of payment. Transfers are to be subject to conditions prescribed by the Board. Failure to comply with any of the conditions makes the loan become immediately due and payable. All moneys loaned are to be expended under the supervision of the Board. The settler must specify in writing the goods or property which are to be purchased with the moneys comprising the advance required, the prices of the same, and the names and addresses of the persons, firms, or corporations from whom the said goods are to be purchased.

The Board, can, with the approval of the Governor-in-Council, make provision for the placing of returned soldiers with farmers in order that they be instructed in farming, establish agricultural training stations for returned soldiers, hire farm instructors and inspectors to assist settlers with information and instruction in farming, and provide training in domestic science for settlers' wives and female dependents.

Agriculture is sufficiently important to invite the special attention of boards of trustees of rural schools and of schools in cities and towns. Progress will not be rapid unless the teaching of the subject is backed by a strong public opinion, and the boards and trustees must assist in creating that opinion. When such supporting public opinion is assured, the subject may then be made compulsory in the public schools.—J.B. Dandeno, Inspector, Agricultural Classes, Ontario.

PART I

Dominion Department of Agriculture

THE DOMINION EXPERIMENTAL FARMS

THE DIVISION OF ANIMAL HUSBANDRY

ECONOMICAL SUBSTITUTES IN SWINE FEEDING

BY G. B. ROTHWELL, B.S.A., ASSISTANT DOMINION ANIMAL HUSBANDMAN

THE present cost to produce a hog finished for the market, where maintenance, breeding, and feeding charges for the dam are properly charged, and where a conservative percentage of the feeding and breeding costs is added to cover overhead charges and risk, would appear from estimates at the Central Experimental Farm to average $20. A fair, but not excessive, profit should be possible with present pork prices where good management is applied.

The feed situation, however, is, far from bright at the present time. Standard hog foods comprise but a short list—corn, barley, wheat by-products, and oats. Corn has been practically off the market, is now procurable in a limited way, but at a price almost prohibitive for fattening purposes. Barley is far from readily available, and at top-notch prices. Wheat by-products are now limited to shorts and bran. The former, possibly the most commonly used Canadian hog food, will be available, it is to be hoped, in fairly reliable quantities with no possibility of a surplus, and at a fixed price. Oats at present prices may be used with economy only to induce milk flow and the growth of bone and sinew, i.e., with the milking sow and the weaned pig. In short, the whole matter of available hog foods rests upon an entirely unstable foundation. Are there avenues of relief?

THE USE OF CONCENTRATED SUBSTITUTES FOR CEREAL GRAINS

At the Central Experimental Farm during the past several years numerous concentrated by-products have been used in the experimental feeding of hogs. A complete résumé of such work would be lengthy, and distinctly unprofitable in the present instance. It would be idle to contemplate the use of foods now off the market, or quite unreliable of supply.

Of the concentrates which may now be procured—in, however, limited quantities—cottonseed meal, gluten meal, gluten feed, linseed oil meal, distillers' grains, corn oilcake, and corn bran may be mentioned. Not any one of the above concentrates may be listed as readily procurable.

CONCENTRATES FOR FATTENING

In 1915-16 and 1916-17, cottonseed meal, gluten feed, linseed oil meal, and distillers' grains were all shown to have high values for fattening purposes where these feeds entered into the mixtures in quantities depending upon their protein content. Briefly, in 1915-16 the

following percentage additions to a basic corn, shorts, barley ration gave economical and healthful results,—gluten feed 20%, linseed oil meal 17%, and cottonseed meal 13%. The following winter, a similar experiment showed the injurious effects (protein poisoning) of increasing the percentage addition in the case of linseed and cottonseed meal. Where fed in the original percentages good results were obtained. Distillers' grains were further shown to give good results as a 20% addition.

Linseed oil meal may be safely fed as indicated, and is a concentrate to be recommended at the present time. Gluten feed as high as 30% of the ration is another valuable substitute where procurable. Cottonseed meal, while giving phenomenal results, should not be widely recommended as a hog food. Distillers' grains are becoming increasingly difficult to obtain. Corn oil cake (no experiments at Ottawa), where procurable, is a high-class concentrate fed with shorts or bran and skim-milk. Corn bran, of limited supply, may enter profitably into the ration of the brood sow, or the fattening hog. Not more than 20% should be fed owing to the rather fibrous nature of the food. While more in the nature of a by-product, elevator screenings, graded as buckwheat screenings, has given consistently good results, a fact particularly worthy of note at the present time. In 1915, a ration of buckwheat screenings and skim-milk proved about equal to a standard ration of corn shorts and oilcake, showing a value of $27.60 at prices then current. In 1918, in a series of experiments conducted in duplicate, buckwheat screenings and milk gave the highest gains in both first and duplicate lots. The addition of shorts, oil meal, and tankage, was apparently in no wise an improvement over the whole screenings.

The one thing to be remembered, however, is that the inferior grades of elevator screenings have been proved of little value for swine feeding (C.E.F. 1917).

THE FOUNDATION OF THE HOG FEEDING QUESTION—A LARGE HEALTHY LITTER IN SUMMER QUARTERS

CONCENTRATES FOR THE YOUNG AND GROWING PIG

There is little room for deviation from accepted practice in the feeding of young pigs. A bone building ration with low percentage fibre is necessary. Ease of digestibility is essential. Wheat middlings and skim-milk while being taught to eat, with middlings, sifted oats, a little corn, and skim-milk after weaning, form excellent rations. Skim-milk is almost a necessity. To find a substitute, three years of experimental work have been carried on at Ottawa. Tankage, oil meal, and skim-milk were the chief centres of interest. Briefly, tankage proved a poor substitute where it directly replaced skim-milk, both in quality of pigs and cost to produce. As an addition to a ration containing skim-milk, it showed consistently inferior to oil meal. In fact, as has already been pointed out, no benefit could be seen in adding this expensive meat by-product to an already balanced ration. Thus, while skim-milk and corn or barley gave consistently marked results over corn, tankage, and water, it also showed a slight superiority over corn, tankage, and milk for weaned pigs.

Tankage, however, may be regarded as a milk substitute. Best results have been obtained at Ottawa where pigs were weaned without milk by supplying the meal dry in a self-feeder, part of which was partitioned off and filled with dry tankage. This was consumed as required. Water was, of course, supplied at all times. While experiments at Brandon in 1916, with the feeding of tankage to young pigs, show conspicuously the value of skim-milk, the former stood in the light of a good substitute. Grain only produced gain at a cost of 9.8 cents; grain plus 16% tankage 7.1 cents, and grain plus skim-milk 6 cents. The pigs fed averaged 85 pounds in weight, as against the six to eight week old weanlings of the Ottawa tests. It must be remembered, however, that the reputation for tankage has been gained largely through its use as a balance to corn, a grain that for the production of economical gains must be fed with some protein supplement.

THE USE OF SOILING AND PASTURE CROPS

Soiling Crops.—The use of green feed, cut and fed to hogs, while applicable in cases where a few hogs are kept has the following disadvantages:—(1) It is wasteful—the hogs soil much of the material; (2) the feed when exposed to the sun becomes soft and unpalatable; (3) laborious,—nowadays the hog should largely feed himself. Nevertheless, in 1913, on a meal valuation of $28 per ton, green cut clover was worth $4.81 as a hog food, replacing one-sixth of the meal ration. In 1915, green cut rape was actually fed at a loss when added to the meal and milk ration. In 1916, green cut alfalfa showed a value of $2.62 per ton. The beneficial effect of feeding clover and alfalfa to pen-fed hogs was very evident from a health standpoint.

The subject of pastures for the growing pig is receiving much attention at present. Owing to cramped quarters, little experimental evidence is available from Ottawa, and information is largely gleaned from stations at Lacombe, Brandon, and Lethbridge.

As a single pasture crop alfalfa would appear to be unexcelled. Rape has also given good results. Clover is almost equal to alfalfa, a significant fact, considering that the growing of red clover is wider spread, subject to fewer difficulties, and generally better understood than alfalfa. Heavy seedlings (3 to 3½ bushels per acre) of barley, oats, or wheat have given excellent results. Of the cereals sown singly, barley has proven the best pasture crop. A mixture of barley, wheat, and oats, equal parts, has also been used successfully, later reports indicating, however, that the mixture is inferior to barley alone. As a commercial proposition, a summer pasture of alfalfa, clover,

or a spring-sown grain or grain mixture will give cheap, home-grown, self-harvested feed for growing pigs. Late summer and fall pasture should be supplied by rape. As to the stock-carrying capacity of the crops mentioned, an acre is conservatively shown to pasture from ten to fifteen hogs in the growing season.

The economy of pasturing is strikingly shown in one experiment (Lacombe), where the cost per hundred pounds gain in paddock feeding was $5.30. The average cost to produce with six groups each pastured on the different crops mentioned was $3.54.

Vegetables, orchard, and garden refuse have a certain value as hog food, and, while no actual data is available, such material is carefully collected, and affords a healthful and more or less efficient meal-saving food for breeding stock and growing pigs. It should be emphatically pointed out that, as shown, one of the most economical substitutes for meal with the growing and fattening hog is pasture; also that it has been clearly demonstrated that the use of the above food should not be forced too heavily upon the pig under three months. For the weanling, a ration light in fibre is essential.

MILK PRODUCTS AS SUBSTITUTES FOR MEAL

Skim-milk for the growing hog may rightly be claimed as the best single food. The common statement that with meal at $20 per ton, skim-milk is worth 20 cents per cwt. is all too conservative. For light, growing hogs, 60 pounds and over, 400 pounds skim-milk has showed equal on the average to 100 pounds meal, which at present prices gives milk a meal equivalent value of 63 cents. While the above may be taken as an average, experiments too numerous to mention specifically have shown that for the young growing hog, skim-milk at pre-war prices for meal ($25 to $28) showed values ranging from 28 cents with heavier hogs, to 79 cents for lighter individuals.

Buttermilk, fed fresh, wherever comparison has been possible, is the equal of skim-milk. Whey is not generally procurable on the Farm system. While not regarded as valuable to the same extent as either of the two previous products, reports from Lacombe in 1917 show 100 pounds fresh whey capable of saving 19.2 pounds meal, or attaining a value of almost 20 cents per cwt. with meal at $20 per ton. Much of the palatability, and consequent value of whey, is frequently lost through feeding it in a badly soured or decomposed state. Of all milk products, it may be generally stated that the value of whey is least appreciated. At the present time it is possibly the only one wasted to any extent, and particular stress should be laid upon its value as a meal substitute, fed sweet and fresh.

Skim-milk must not be over-fed, however, for most economical returns. A small proportion of skim-milk fed shows a high meal equivalent. Much valuable feed is not only wasted, but lost with disaster to the pig as well, from over-feeding skim-milk. A study of experimental evidence would show that for the best results with young pigs, 1 pound of milk to 2.5 or 3 pounds of meal should be fed. A greater proportion of milk shows a decreased value as a meal substitute. For older hogs less milk may be used, tests and general observation at Ottawa indicating that for the 100 pound hog and over not more than 5 pounds should be fed daily.

Practice has indicated the advisability of feeding milk sweet to very young pigs. As the digestive system becomes stronger, however, comparison shows little difference in the results of feeding sweet or soured milk, provided whatever condition favoured is uniformly kept up, i.e. milk always sweet or always sour. Sour milk is certainly easy to obtain, and would also seem to have a beneficial action upon the digestive apparatus not seen with the sweet product. Best results with whey or buttermilk have usually been ob-

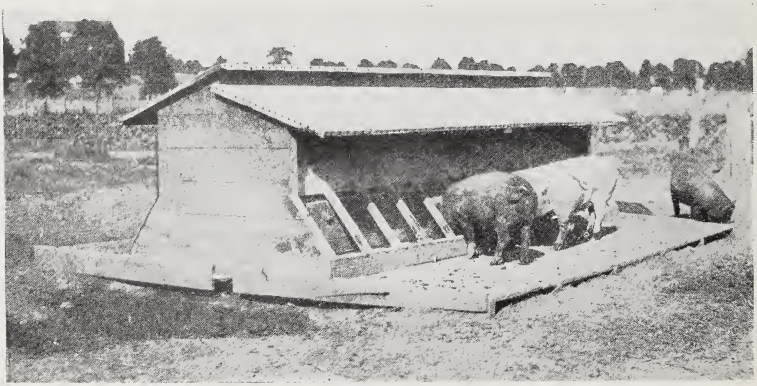
tained where they are fed fresh, before sufficient change has taken place to decrease palatability and digestibility.

SAVING LABOUR IN HOG FEEDING

Practice indicates that two feedings daily is sufficient for the fattening hog; indeed, that with the exception of the young pig, feeding twice daily is preferable to three. In 1914, at Brandon, this fact was indicated, no appreciable difference in gain being shown to balance the extra labour of feeding. Realizing that the indication of one experiment is not conclusive, it may be said that close observation at Ottawa and findings of other institutions point to the same result. Many hog men feed breeding stock, and even growing hogs, on good pasture but once daily. After such a statement, there is an apparent inconsistency in the fact that results equal to those of expert hand feeding may be obtained where the food is placed within reach of the hog at all times. Yet such is the case. Experiments at Ottawa, Brandon, and Lacombe all point to the feasibility of the self-feeding method, and to the fact that it gives results equal to hand feeding with a reduction of from 60% to 80% of the labour of feeding.

SELF-FEEDING TRIALS

At Ottawa, the use of the self-feeder vs. trough feeding for three years would indicate (1) self-fed hogs require .1 pound more meal per pound gain than to the trough fed (average of two years); (2) that entirely aside from the saving of labour, hand feeding gave rather cheaper costs (.29 cents) per pound gain; accounting for labour saved, this slight gain would be reversed; (3) that invariably hogs may be finished in shorter time where self-fed; (4) that waste is almost entirely eliminated (provided the feeder is of correct design); (5) that digestive disturbances sometimes caused by over-feeding by hand are rarely, if ever, seen; (6) that while it is quite possible to wean little pigs direct to the feeder, they make more economical gains where hand fed until three months of age.



SIX-FOOT FEEDER, A SIZE SUITABLE TO GENERAL FARM REQUIREMENTS

At the Experimental Farm at Brandon, Man., self-feeders gave excellent satisfaction in pasture experiments conducted in 1916, and their use was recommended by the superintendent. No comparative results were available.

THE SELF-FEEDER ON PASTURE

At the Experimental Station at Lacombe, Alta., where swine feeding is a major feature, self-feeders were tested in 1916. This experiment, conducted on pasture, indicated a greater grain cost per pound gain for the self-fed hogs of .84 pounds, and a lesser time cost of 51 days in a feeding period of 92 days. While, as at Ottawa, hand-feeding here gave slightly lower grain costs on a short feeding test, later indications were that self-fed hogs, fed to a finish, showed greater economy of gain than those fed by the common method.

During the past season the self-feeder-pasture system is shown as being the most economical. Rape pasture saved 2,453 pounds of grain per acre, as compared with the grain cost of producing the same amount of pork without pasture, both groups being self-fed. Rape pasture, with meal self-fed, carried hogs at the rate of 9,254 pounds per acre for a feeding period of one hundred and forty-six days. For the pasture season, with grain self-fed, indications are that an acre of land will carry an average of four thousand pounds live weight of hogs. As for the self-feeder, this device would appear to increase the capacity or power of one man, one hundred per cent. at least, as compared with hand feeding.

As to economy of grain, these later experiments showed for the self-fed group 4.34 pounds of grain per pound gain, as against 4.72 pounds for the hand-fed lot, both on rape pasture. With the self-feeder, the grain cost per pound gain is usually higher than where hand-fed. At Ottawa, in 1917, the following results were obtained on dry lot feeding:—

	Meal, milk (trough-fed)	Meal, milk (self-fed)	Meal tankage (self-fed)
Average weight per pig at start	16.9 lb.	20.8 lb.	26 lb.
Number of days in experiment	88 days	66 days	66 days
Average weight per pig at finish	92.1 lb.	90 lb.	60.9 lb.
Average daily gain	8.5 lb.	1.05 lb.	.53 lb.
Meal eaten per pound gain	1.51 lb.	1.79 lb.	3.9 lb.
Skim-milk per pound gain	5.2 lb.	4.1 lb.	———
Cost per pound gain	4.8 lb.	5.3c.	10.1c.

The rapidity of gain of the self-fed group, the value of skim-milk as a meal substitute, and the high cost of production of the tankage fed group, are points worthy of note.

FACTS AND DEDUCTIONS FOR THE COMING SEASON

1. Wheat by-products, barley, corn, and certain of the concentrates already mentioned, may be procurable during the coming season. There is no guarantee of supply.

2. Barley is practically the equal of corn. By growing barley this summer, the hog feeder may be more independent of the feed market.

3. All possible conservation of meal is desirable. Milk products, unless their use is possible for direct human consumption, form the greatest of pork-producers and grain substitutes.

4. Garbage, where the collection of such may be arranged and regulations complied with, is almost a complete food in itself, or at least, possible of substituting a large part of the grain ration.

5. Middlings, the food of the little pig, and no longer obtainable, may be replaced by 70% shorts, 20% corn meal, and 10% oil meal. With this, milk in some form is the one best food. Too much substitution with the young pig is likely to result in disaster.

6. Increased hog raising with decreased labour, is made possible by the self-feeder.

7. Pastures, as mentioned, form meal substitutes that cannot be neglected this year by the grower of swine who looks for a fair profit.

8. A combination of pasture or successive pastures with milk by-product and grain self-fed, is especially recommended as an ideal system. Tankage and a self-watering device are mentioned where milk is not obtainable. Cheap, home-produced feeds are thus largely supplied. The hog supplies a great part, but not all, of the labour.

THE DIVISION OF HORTICULTURE

THE VALUE OF GARDEN COMPETITIONS

BY W. T. MACOUN, DOMINION HORTICULTURIST

IF I were asked to state in a few words what is the greatest value of a garden competition, I should say, "It is the inspiration to greater effort and higher achievement." But while it is possible in a few sentences such as that to say all that is really necessary on the value of competitions, it is presumed that something more is expected.

THE DIFFERENT ORDERS OF GARDEN MAKERS

Makers of gardens may be divided into several groups: First, those who are enthusiastic and ignorant, but anxious to learn; second, those who are ignorant, but too confident or conceited. They have the confidence of ignorance, which is not an uncommon characteristic of the man or woman who has read a great deal about gardening and thinks he or she knows all about it, although his or her practical experience is very small. Then there is the skilful and successful gardener who has good reason for thinking himself in a class by himself, but fails to recognize the merit of others; and, finally, there is the enthusiastic, successful and skilful gardener with his place clean and in good order, always on the lookout for information, and eager to impart his knowledge to others.

A garden competition puts each of these gardeners into the proper place, and opens the eyes of each to individual shortcomings, and to the skill and good taste of others. The gardener, in thus having a proper value placed by the judge, gets both information and inspiration to greater effort next year.

BENEFITS DERIVED FROM COMPETITION

The friendly rivalry which a garden competition brings about leads to intercourse which would not otherwise take place, and the visits which competitors pay to one another's gardens, and the observations made from the street, and the new varieties which they are becoming acquainted with, do much to bring about a greater incentive to improvement, and the standard of each is raised.

Not only is the owner of the garden benefitted by the competition, but naturally the whole family is more interested in the garden than they would be if it had not been entered in the competition, and there is no doubt but that the younger members will be more likely to make gardens of their own later on if they go from a home where there has been a good garden.

Then there is the value of a garden competition to the town or community. Good gardens scattered here and there through the city or country give an enviable reputation to the community, and the more good gardens there are the better the reputation.

If a garden, through the special effort which a competitor makes, becomes conspicuously better than those nearby, the likelihood is that the owners of the latter will at least

keep their places neater than they otherwise would do. It is seldom that a garden that has been raised to a certain standard through the efforts made to win in a competition is allowed to return to the condition it was in before.

RESULTS OF COMPETITIONS

There have been garden competitions held in the city of Ottawa since 1901, and it is believed that very good results have come from them. The first competition was inaugurated by Lady Minto, the second by Lady Grey, and then the Ottawa Horticultural Society continued the good work. Last year the Ottawa Vacant Lot Association held a very successful vegetable garden competition, and there has been one in connection with the St. Andrew's Church Glebe Gardens, Ottawa, for the past three seasons. The provincial vegetable field and garden competitions are well known, and have been productive of much good.

There should be a score card for the best results in a garden competition. It is useful both to the judge and to the competitor. Judges differ in their ideas of the value to be set upon different things, and, when judges are changed every year, competitors never know what to expect or to prepare for, but when a score card is available both to the judge and to the competitor, each acts, or should act, according to it.

EXAMPLE SCORE CARDS

Following are some score cards used in Canada which have come under the writer's observation:—

THE OTTAWA VACANT LOT ASSOCIATION

Score Card for Lots Growing Various Vegetable Crops

Lot No..... Maximum, 100 points, based on the following: Area....

	Public Score	Judge's score		
		July	Aug.	Sept.
1. Arrangement of the crops and methods of planting and caring for them	20			
2. Uniformity of the stand	10			
3. Healthiness and freedom from disease and insect pests	15			
4. Number of kinds grown and value of the vegetables	30			
5. General neatness of the plot and freedom from weeds, etc	25			
Total	100			

.....Date.

Name of Lot Owner.....Address.....

Prize awarded .....Judges.....

ST. ANDREW'S CHURCH GLEBE GARDENS

SCORE CARD

	Possible Score		Judge's Score.
General appearance considering:—			
(1) Method of planting	10		Potatoes
(2) Arrangement	10		
(3) Uniformity of stand and growth	15		25
(4) Vigour and freedom from injuries	10	45	
Quality, and value of vegetables		20	25
Assortment of vegetables		20	
Cleanness and neatness		15	50
Total		100	

....

Date. Judge.

Where more than one visit is made the score for method of planting and arrangement is not made after the first visit.

ONTARIO DEPARTMENT OF AGRICULTURE
SCORE CARD, GARDEN COMPETITION

	Possible Score	Judge's Score
Layout and general arrangement, considering:		
(a) Straightness of rows and proper spacing of plants	10	
(b) Arrangement of space in garden	10	
(c) Neatness and cleanliness round buildings and yard	10	
(d) Neatness, care and cultivation	40	
(e) Clean fence corners, headlands, pasture plots	10	
(f) Closeness of planting and marketable value of crop per acre considered	20	
Total	100	

.....Judge.

.....Date.

If points are lost owing to natural difficulties impossible to overcome, the judge may allow a maximum of five points.

FLOWER GARDEN COMPETITION

Score card used in judging gardens in the Lady Minto and Lady Grey Flower Garden Competitions:—

	Points
General effect	20
Cleanness and order	20
Floral display	20
Labour and enthusiasm	20
Total	80

Five visits were made, making a total of a possible 100 points for each.

THE DIVISION OF POULTRY

THE DISTRIBUTION OF DAY-OLD-CHICKS

BY F. C. ELFORD, DOMINION POULTRY HUSBANDMAN

WE have done comparatively little in the distribution of day-old chicks. We have occasionally sent newly-hatched birds to our branch farms, and our branch farms have shipped to us, and one to another, with very good results. We have used the ordinary corrugated paper boxes manufactured and sold by practically all supply houses for this purpose.

The chicks are shipped as soon as they are taken out of the incubator, shipped without feed or water, and are usually at their destination when it is advisable to give them feed.

Our experience has shown that trips over two days in length are not satisfactory, but distances that require less than 48 hours can be covered without difficulty.

This year we hoped to have been equipped for hatching larger quantities at our various farms, in which case we would have sold day-old chicks much more extensively than we have done up to the present. The equipment for this extra hatching, owing to difficulty in transportation, has not yet been delivered, and it may be our expectations in doing more in the day-old chick business will not be realized this year.

The day-old chick industry is growing. Every year more inquiries for the chicks come in, and though throughout Canada the shipping of day-old chicks in preference to eggs is comparatively new, the indications are that it is becoming the more popular way of getting the young stock.

THE ENTOMOLOGICAL BRANCH

THE HABITS AND CONTROL OF WHITE GRUBS IN MANITOBA

BY NORMAN CRIDDLE, DOMINION ENTOMOLOGICAL LABORATORY, TREESBANK, MAN.

WHILE White Grubs have never been a very serious pest in the Prairie Provinces, they are, nevertheless, at times of considerable economic importance as destroyers of growing grain, grasses, and certain kinds of truck crops. The June beetles, the adults of the white grubs, attack the foliage of many trees and shrubs, at times effecting much injury. As the beetles feed upon the leaves of trees, they are, in consequence, restricted in their feeding areas to situations from which they can easily gain access to their food plants, consequently, we do not find them on the treeless plains.

Four different species of White Grubs are at present known to occur within the province of Manitoba, namely, *Lachnosterna anxia* Le Conte (=*dubia* Sm.), *L. nitida* Le Conte, *L. drakii* Kirby (=*grandis* Sm.), and *L. rugosa* Melsh.

Distribution and Environment

Lachnosterna anxia Le Conte. This species is an inhabitant of either rich soils or lowlands, and, therefore, most frequently met with along the river flats or in the vicinity of moist willow-inhabiting areas. It has a wide range in these situations, and extends in the West from the eastern border of Manitoba to the Pacific.

L. nitida Le Conte. In Manitoba this species is frequently found in company with the last, but has a greater preference for woodlands and a drier condition of soil. The adults seldom leave the open groves in which they breed, and thus, while numerous, are easily overlooked.

L. drakii Kirby. An inhabitant of sandy soils in the vicinity of open woods; larvæ are often found among the roots of low bushes such as wild cherry, thorn, etc., and in dry valleys. It is quite abundant in its chosen haunts, which frequently overlap those of *L. rugosa*.

L. rugosa Melsh. Like *L. drakii*, this species inhabits sandy soils, and the only difference in its choice of locality is that it prefers higher and more open situations for breeding purposes.

Life History

SUMMER HABITS

All the above species have in the province of Manitoba a four-year life-cycle, of which the egg stage occupies about one month, the larval life three years, the pupal condition one month, and the beetle eleven months. Since, however, all eggs are not laid at the same time, and pupæ may be met with from the end of June until the middle of September, these stages collectively cover considerably longer periods.

L. anxia Le Conte. Adults emerge during the middle of May, their time of appearance being apparently governed by factors which also influence the leafing of trees. Thus, we can reasonably expect to meet with the adults of this species at the time when willows and aspen poplars are beginning to burst their buds. While, however, the beetles appear in late May, they do not attain their greatest activities until June, when most of the eggs are laid. But few adults survive beyond the middle of August. The eggs are deposited singly in small cavities prepared by the female beetle; surrounding these are little balls of earth, also constructed by

the beetle, upon which, there is every reason to believe, the small grubs feed. The egg itself is at first cylindrical, but later becomes almost round by expansion. Eggs are generally found to a depth of one to four inches, a few being deposited each day, the entire period of egg-laying extending over several weeks.

After eating its way through the earthen chamber, the small larva lives chiefly upon decayed vegetation for the first season. The second summer is also one of comparatively small economic importance, and it is only when the grubs become very numerous that they are appreciably destructive. Thus, the third season's growth is under way before the insect acquires the reputation of being a pest. It has now, however, reached a stage when living roots are sought in preference to decayed matter, with the result that many kinds of crops may suffer. The destructive tendencies increase as the larvæ develop, and reach their greatest magnitude in June at the end of the third year, a week or two before pupation. When about to pupate the grub constructs a large chamber close to where it has been feeding. It then gradually becomes motionless and assumes a soft, watery condition, yellow in colour. The grub now gradually shortens, and in due course transforms into a true pupa. The prepupal yellow stage commences about June 26th; pupæ are present early in July, and beetles have developed from them by the middle of that month. Adults usually remain in the pupal chamber until about to emerge the following spring.

With the addition of the brief details presented below these facts are equally referable to all our species.

L. nitida Le Conte. This species is rather later in appearing than *L. anxia*, and seldom leaves the vicinity of its breeding grounds which are described above. In feeding, it seems to have a preference for aspen poplar, though it has also been found attacking elm. Eggs are prevalent in July, and from then larvæ commence to appear late in the month and continue to do so throughout August. In the years the larvæ turn to pupæ, these latter are numerous by July 13th, and have developed into beetles between August 1st to September 3rd.

L. drakii Kirby. Our largest kind. Beetles appear slightly later than *L. rugosa*, and have reached the height of their flight at the time when the oak trees are leafing out. Their chief food consists of aspen poplar and oak. Eggs newly laid were discovered on June 23rd, from which young grubs continued to hatch from July 11th to September 5th. Pupæ are numerous by July 15th, and have been taken in the field as late as September 15th. Fully developed beetles appear in early August, though the majority do not develop until late in the month.

L. rugosa Melsh. By far the most abundant species on sandy soils. Beetles emerge soon after the trees come into leaf. They are general feeders, and have been taken from the following trees or shrubs: apple, plum, cherry (wild), thorn, rose, elm, maple, oak, and aspen poplar, the last named being most frequently attacked and the first but rarely.

Large numbers of eggs were collected in the field. They were found at depths varying from one to seven inches, and are plentiful in the soil from the third week in June until August. Larvæ commence to appear in mid-July and continue to do so until September. Most examples, however, emerge from the eggs between July 20th and August 8th. Prepupal conditions commence about July 10th, from which true pupæ are formed some eight days later. These have transformed into beetles about the middle of August. There is, however, considerable variation in the various developments.

WINTER HABITS OF LARVAE

All White Grubs winter some distance beneath the surface, the depth at which they do so varying with the

different species; thus, the average depth at which the larva of *L. anxia* hibernates is forty-four inches in dryish woods and from fourteen to twenty-five inches in wet situations. The average depth of *L. nitida* is thirty-four inches, *L. rugosa* seventy-four inches, and *L. drakii* about forty inches. But few examples of this last have been located in their winter homes, consequently there is some doubt as to the exact depth at which these latter grubs hibernate. With those species which are found in or around woods or bushes, the falling leaves and drifting snow naturally protects them from frost. In the more open parts, such as those inhabited by *L. rugosa*, there is no such protection, hence we might expect, as is actually the case, that there would be a greater penetration into the soil to escape the cold.

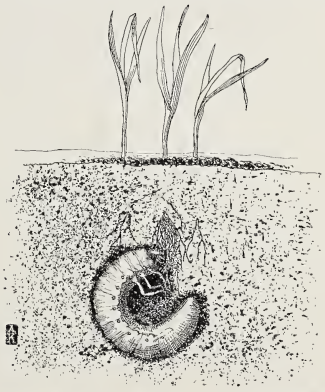
MAY BEETLE, OR JUNE BUG, THE ADULT OF THE WHITE GRUB. (After Gibson)

WINTER HABITS OF BEETLES

The fact that *Lachnosterna* larvæ burrow downwards in winter time is well known. It has not hitherto been recorded that some of the beetles do likewise, though it is, nevertheless, a fact. Of our four species, *L. anxia* and *L. drakii* remain in the pupal chamber, or very rarely burrow down a short distance. *L. nitida* usually moves slightly below its pupal cell, and is found at a depth of approximately six inches, with odd ones going down to as far as one foot. *L. rugosa*, however, is quite unlike the other three species, and has a marked downward movement, which commences soon after the beetles attain maturity, that is to say, about September 1st. From this time, the beetles make their way rapidly downwards, and at the approach of winter average twenty-nine and a half inches below the surface, with a minimum depth of sixteen inches and a maximum of forty-seven inches. Specimens dug up and placed again in the soil burrowed to an average depth of twenty inches in forty-eight hours.

PUPA OF MAY BEETLE. (Original)

It is interesting to note here that allied genera have also developed this habit. For instance, the adults of *Diplotaxis obscura* Lec., a prairie species, have been found in Manitoba at a depth of from twenty-four to thirty-five inches below the surface. *Serica serica* Ill., a wood-loving insect, does not burrow downward, but

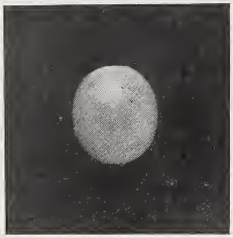


WHITE GRUB FEEDING ON ROOTS OF GRASSES. (After Gibson)

the larvæ do. Adults of *Dichelonycha subvittata* Lec. have been located at depths of fifteen inches in the soil.

All of our *Lachnosterna* beetles work upwards ahead of the larvæ.

This is doubtless due to their being less deep in the soil, and in consequence feeling the effects of the spring thaws sooner. On reaching the surface they do not necessarily emerge, but may remain among the leaves or earth close to the surface ready to take advantage of the first really warm evenings when they arise and fly to the trees to feed.



EGG OF MAY BEETLE. (Original)

METHODS OF CONTROL

Methods recommended for the suppression of White Grubs are based entirely upon a knowledge of the life-habits of the insects and those of their natural enemies. The following facts have been of particular importance in enabling us to arrive at conclusions concerning the more practical means of controlling White Grubs in Manitoba.

1. The grubs are below the plough line from October 7th to May 14th.

2. The beetles of *L. rugosa* are below the plough line from September 1st to May 1st.

3. Eggs are most prevalent in the soil between June 12th and July 24th, and nearly always occur in soil upon which vegetation is growing, especially grasses.

4. The prepupal and pupal stages occur between June 10th and August 15th.

5. The average depth at which all stages of these insects are found in summer is four inches.

6. Birds are most persistent followers of the plough during their breeding season or while migrating; gulls and terns from May 16th to June 22nd, and for a short time late in July; crows and blackbirds, including grackles, from the time grubs appear in May until July 1st.

From the foregoing we reach the conclusion that to attain the best possible results under conditions existing in Manitoba, ploughing should be done between May 14th and July 1st, and at an average depth of five inches. The idea is, of course, to turn up as many grubs, eggs, or pupæ as possible, a majority of which will, in all probability, be picked up by birds. Many eggs will be destroyed by the plough alone, but it is advisable to harrow as soon as possible after ploughing, as by this means numerous egg cells will be broken, causing a large percentage of deaths among the eggs and newly-hatched young, besides exposing them to attack by birds. Exposed pupæ will also be destroyed by this method.

So far as the interests of farming is concerned, it will be observed that the above recommendations do not in any way clash with the best cultural methods. There is good reason for believing, too, that they will prove of value in the destruction of wireworms.

With reference to the large part birds are expected to play in this work, it may be claimed that birds are not always present in sufficient numbers, and that their capacity is, after all, limited. Granting this to be true in certain districts, we must remember that White Grubs are only found within comparatively close range of trees, and that their principal habitats coincide with the haunts of crows, the most persistent of all plough followers. Thus, if there are no crows present the farmer and sportsman are probably largely to blame, and the question then resolves itself into the economic one as to which does most harm, the crows or the White Grubs. We do not think there can be much doubt on this point in grub-infested localities. The writer has personally seen fully ninety per cent. of White Grubs

exposed picked up by crows when he was himself the ploughman.

Blackbirds (*Agelaius phœniceus*) are more dependant upon water than crows, hence are not so evenly distributed, but when present prove very efficient grub destroyers. Cow birds (*Molothrus ater*) are also extremely useful in this respect, and probably largely compensate for their parasitic habits by this means.

Fall ploughing in Manitoba, while accounting for a few pupæ in September, is not a practical means of destroying White Grubs. Birds at that time have congregated into flocks preparatory to migrating southward, and are then more inhabitants of grain fields. Thus, the grubs readily make their way into the ground again. After October 7th, most of the grubs have burrowed down below the frost line; they are also out of reach in April and usually in early May.

CROPS MOST SUITABLE FOR SOWING ON INFESTED LANDS

Grass lands are especially attractive to June beetles for egg-laying purposes, and should there be any of these insects in the neighbourhood they are sure to be found breeding in such places. This also applies with equal force to wireworms, and only in a slightly less degree to grass-stem maggots. It is a misfortune that one of our most useful and widely grown grasses in Manitoba (western rye grass) is specially attractive to all of these insects, and that in White Grub areas it suffers very severely from their attack. Fortunately, this drawback does not apply to anything like the same extent where brome grass is concerned. The farmer must suit his own convenience as to sowing these grasses, taking into consideration the fact that rye grass is especially attractive to insect pests while brome grass is not. This latter, however, has the misfortune of being difficult to eradicate.

Grass lands, as was pointed out above, should be ploughed not later than July 1st to destroy White Grubs. Wheat should not be sown upon such land if avoidable, but preference may be given to winter rye, the next cereal in resisting power being spring rye, and after this oats. Usually a slightly thicker seeding than usual is advisable on newly-ploughed grass lands.

NATURAL ENEMIES OF WHITE GRUBS

While the birds mentioned previously might rightly be claimed as natural enemies of these insects, the above heading is more strictly referable to those animals which habitually live upon them without availing themselves of the aid supplied through man by means of the plough or some other cultural implement.

SKUNKS. These animals have been so misunderstood and their powers in other directions so exaggerated that the average farmer would probably be the last to rate them as his friends, though in reality he has few more useful ones among the wild animals. Should there be a skunk present the farmer may soon learn whether his fields are infested with white grubs through the many small holes which the skunk has made in digging them out. As this animal locates its food by scent, it is able to ascertain the presence of grubs without seeing them, and thus becomes extremely useful as a means of their destruction. In pointing out the value of skunks as destroyers of noxious insects we must not, however, forget that they also occasionally destroy hens eggs and poultry, though the small losses occasioned in this way are not to be compared with the benefits described above.

BIRDS. Robins are eager seekers after White Grubs, and have been known to frequent infested fields for weeks. Crows, apart from their habit of following the plough, are also very useful as grub searchers; the same may be said of flickers.

There are many other animals that eat White Grubs, or the June beetles

to which they develop, such as badgers, shrews, and even field mice.

INSECT AND OTHER INVERTEBRATE ENEMIES OF WHITE GRUBS

Parasites undoubtedly play an important part in reducing our farm pests to normal numbers, and in this respect they are equally effective in controlling White Grubs. Of the more important parasites reared from these latter during the last four years in Manitoba the following seem worthy of record.

TACHINIDAE. The species *Cryptomeigenia theutis* Walk. attacks the beetles, from two to nine puparia having been found in single individuals; about fifty per cent. of these beetles were killed by this parasite in 1914. *Microphthalma disjuncta* Wied. a common fly parasite in White Grubs and allied genera.

DEXIDAE. *Ptilodexia abdominalis* Desv. and *P. tibialis* Desv. In larvæ, the former rare and the latter numerous. *Myiocera cremiodes* Walk. (?) has also been found in grubs.

MITES. *Tyroglyphus heteromorphus* Felt and others have caused the death of many White Grubs.

HAIR WORMS. *Mermithidæ*, long thread-like animals which live within the bodies of White Grubs and emerge after killing them. These have been responsible for about an eight per cent. death rate during the years covered by this investigation.

Fungous and other diseases have also caused many deaths, and seem to play an important part in White Grub reduction.

Mention may also be made of species of *Tiphia* and *Elis*, so useful in other parts of North America. Their appearance among *Lachnosterna* in Manitoba has, however, been seldom observed.

THE SEED BRANCH

SEED TESTING IN MARCH

BY J. R. DYMOND, SEED ANALYST

MORE samples are received during March each year than in any other month. Usually about 25 per cent of the samples received from farmers, dealers, and others, during the year come to us during this month. This year 2,444 samples were received at Ottawa, and 2,469 at Calgary, as compared with 2,665 and 3,182 for the same period last year.

The following table summarizes the results of the germination tests reported during the month:

	Wheat	Oats	Barley	Corn	Peas	Beans	Mangels and Beets
Number of samples reported	90	214	60	169	63	73	51
Average per cent germination	% 90.9	% 84.2	% 91.5	% 49.3	% 86	% 75.8	% 59.7
Number germinating up to standard for good seed	56	71	39	10	39	20	1
Number germinating below ⅔ of standard for good seed	3	23	2	66	2	13	15

Quite a large number of samples of western oats were sent for test by farmers who were thinking of using them as seed. Many of these samples contained four or five hundred noxious weed seeds per pound, including western false flax, stickseed, wild oats, ball mustard, hare's-ear mustard, stinkweed, and wild mustard. Many of them germinate from 50%

to 75%. The use of such seed will not only produce a very poor stand of grain, but will pollute the land in which it is sown with some of the worst western weeds.

The grading of timothy and clover samples is summarized below:

	Timothy	Red Clover	Alsike	Alfalfa	Mixture
Number of samples received	648	581	267	46	101
" received from farmers	242	135	64	11	40
" " " merchants	392	423	185	34	60
" grading No. 1	75	118	49	12	2
" " " 2	219	166	78	13	30
" " " 3	184	201	67	14	28
" " rejected	168	93	71	7	40
Other reports	1	2	1	0	1

THE LIVE STOCK BRANCH

THE GRADING AND MARKING OF EGGS

HIS Excellency the Governor General in Council, on the recommendation of the Minister of Agriculture, and under and in virtue of the provisions of subsection (*c*) of Section 9 of "The Live Stock and Live Stock Products Act, 1917," has approved the following regulations respecting the grading and marking of eggs:

1. Canadian eggs for export out of Canada and eggs for domestic consumption intended for shipment from one province to another, but not including eggs intended for incubation, shall be classified and graded as follows—

Class (1)—Fresh eggs which have not been held under refrigeration at a temperature of 40° or less except when in transit or subjected to artificial preservation.

Grade (a) *Specials*—Eggs of uniform size, weighing 25 ozs. to the dozen or over or 47 lb. net to the 30 dozen case; clean and free from stain, strong and sound in shell; air cell small, not over 3/16 of an inch in depth; white of egg to be firm and clear and yolk dimly visible.

Grade (b) *Extras*—Eggs of good size, weighing at least 24 ozs. to the dozen or 45 lb. net to the 30-dozen case; clean; sound in shell; air cell less than 3/8 inch in depth; white of egg to be firm and yolk slightly visible; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Sub-grade (1) *Pullet Extras*—Eggs which have the quality of extras but which fall short in weight shall be known as pullet extras providing they weigh at least 20 ozs. to the dozen or 37½ lb. net to the 30-dozen case.

Grade (*c*) *No. 1's or Firsts*—Eggs weighing at least 23 ozs. to the dozen or 43 lb. net to the 30-dozen case; reasonably clean; sound in shell; air cell less than ½ inch in depth; white of egg to be firm; yolk may be distinctly visible but mobile; air cell stationary; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (d) *No. 2's or Seconds*—Eggs sound in shell; may contain weak watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

Class (2) *Storage Eggs* which have been "held" under artificial refrigeration at a temperature of 40° or less.

Class (2a) *Preserved Eggs* which have been subjected to any process, liquid or otherwise, intended to preserve their quality.

Grade (a) *Extra Eggs* of good size, weighing at least 24 ozs. to the dozen or 45 lb. net to the 30-dozen case; clean; sound in shell; air cell not less 3/8 inch in depth; white of egg to be firm and yolk slightly

visible; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (b) *Extra Firsts*—Eggs weighing at least 23½ ozs. to the dozen or 44 lb. net to the 30-dozen case; clean; sound in shell; air cell less than ⅜ inch in depth; white of egg to be firm; yoke may be moderately visible but mobile; air cell stationary maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (c) *No. 1's or Firsts*—Eggs weighing at least 23 ozs. to the dozen or 43 lb. net to the 30-dozen case; reasonably clean; sound in shell; air cell less than ½ inch in depth; white of egg to be firm; yolk may be distinctly visible but mobile; air cell stationary; maximum allowance at time of inspection not to exceed 2% variation from the grade stated.

Grade (d) *No. 2's or Seconds*—Eggs sound in shell, may contain weak watery eggs and eggs with heavy yolks, and all other eggs sound in shell and fit for food.

Class (3) *Cracked and Dirty*—Eggs, shells which have been checked or broken, smeared, soiled, or damaged in shell, but fit for food.

2. Every case containing Canadian eggs intended for export out of Canada shall be marked on both ends in a legible and indelible manner, with the class and grade of eggs contained therein, and the words "Canadian Eggs," and every case containing eggs that are to be shipped from one province to any other province in shipments of 100 cases or more, shall be marked on both ends with the class and grade of the eggs contained therein, and with the name of the country of origin when other than domestic product. The Minister may from time to time prescribe the form and the size of the letters that are to be used in such markings. Such marks may be accompanied by other trade designations or brands, providing such designations or brands are not, in the opinion of the Minister, inconsistent with or marked more conspicuously than the marks prescribed in these regulations.

3. Canadian eggs for export out of Canada shall be tightly packed in Canadian standard cases in new white fillers and flats, with kiln dried excelsior or corrugated cushions at top and bottom, or one-third fillers on bottom with flats over top and under bottom fillers.

4. Canadian standard cases shall be made to contain thirty dozen eggs. They shall be made of clean, dry and odorless wood. The ends and centre partition shall be not less than five-eighths of an inch thick, the sides, top and bottom not less than three-eighths of an inch thick.

5. Cases containing Canadian eggs in lots of twenty-five cases or more intended for export out of Canada, and eggs intended for shipment from one province to another province in shipments of 100 cases or more, shall not be shipped until they have been inspected and marked by an inspector.

6. The mark of approval to be placed on each case, hereinafter called the "Government Mark," shall include the Maple Leaf and the words "Canadian Eggs," and "Government Inspected" together with the Inspector's number, the device to be in such form as the Minister may approve.

7. Before the Government mark is placed upon any case, the Inspector shall draw samples of at least five per cent of the cases to be marked and shall examine at least one-half of the eggs in each case. The Inspector shall satisfy himself that the samples taken are representative and shall take any further samples and make any further examination that he deems necessary.

8. No cases containing eggs shall be marked with the Government mark unless the warehouse or rooms in which the eggs are held are in a clean and sanitary condition, and further, no cases shall be marked unless suitable accommodation is provided for inspectors to make the necessary examination, such accommodation to include a dark room, facilities for candling, and such fittings as may be required to insure a proper examination.

9. No person other than a duly appointed Inspector shall apply any Government mark to any cases containing eggs.

10. After the contents of any case bearing the Government mark have been removed, such mark shall be obliterated. This shall be done by the person or persons removing the eggs from the case.

11. Collectors of Customs throughout Canada shall not allow any Canadian eggs to be shipped for export out of Canada that are not marked in accordance with these regulations.

12. These regulations, in so far as they affect export shipments, shall come into force as soon as they are published in the *Canada Gazette*, and in so far as they affect shipments from one province to another province, shall come into force on 1st May, 1918.

PART II
Provincial Departments of Agriculture

CO-OPERATIVE PURCHASING OF FARM REQUIREMENTS

In THE AGRICULTURAL GAZETTE for April, 1917, (pages 285-287), there was published a series of articles from different provinces on the subject of "Organization for Marketing Farm Products". Subsequently, in the same volume, other phases of the subject, such as the extension of the system in Ontario counties (pages 784-787), the co-operative marketing of wool (pages 313 and 863-873), etc., were dealt with. The co-operative purchasing of farm requirements, such as breeding animals, fertilizers, seeds, implements, weeds, binder twine, spraying materials, etc., remained to be dealt with, and this forms the topic of the series of articles that follow. In the requests for the required information that were sent to officials of Departments and secretaries of associations, the suggestion was made that the replies should cover:

1. Organization for co-operative purchase.
2. The business policy, with special reference to financing.
3. The method of securing orders from members and the distribution of goods.
4. The amount of business transacted during the past year and the growth or expansion in recent years.
5. Plans for the future, if anything in the way of innovation or extension of service is contemplated.

NOVA SCOTIA

BY DANIEL A. McISAAC, MANAGER, INVERNESS FARMING CO-OPERATIVE SOCIETY

WE are entering the second year of our organization for purchasing farm requirements co-operatively. The growth and expansion of our work in membership far exceeds our expectations. Our experience in soliciting sufficient membership the first year, in order to fulfil our charter requirements, was a somewhat slow process. However, being successful, our first move was to secure a quantity of spring fertilizer and seeds to the value of some three thousand dollars. I am referring to this particularly for the reason that I wish to point out to you our first methods in financing this business, and our success in connection with it. Not having any paid up capital, we were obliged to raise this amount in the bank and pay the drafts as drawn on us. With the fertilizer we found it necessary to give the members four months, with joint notes payable to the society bearing interest, which balanced the interest on the principal, and on the specified date every dollar was paid in, and we sold our goods at a much reduced price from what local dealers were asking.

I am in a position to say that the success of our transactions made a very favourable impression upon many, so that applications for membership began increasing, and we

have at present upwards of 200 farmers enrolled. The action taken by us was an incentive to a great many to become convinced that co-operation was necessary, not only in creating more harmony, but in establishing and defining the problem of the purchase of farm requirements on more direct business lines. Heretofore, the securing of items essential to us was largely left in the hands of any middle man that would voluntarily undertake the work.

We now fully realize the importance to us as farmers of organizations of this nature, and to have headquarters established where each individual farmer can go and ascertain where he can purchase his requirements at the lowest price, and market his goods as well.

The amount of business that will be done by our Farmers' Co-operative Society during 1918 will be very considerable, and we are only commencing. Our membership at first was but 15; to-day it is over 200. Within a year we expect to have a thousand members in the county.

We have proof that the co-operative system is a first-class paying proposition.

NEW BRUNSWICK

BY JAS. D. McKENNA, SECRETARY, NEW BRUNSWICK AGRICULTURAL SOCIETIES UNITED

THE practice of buying co-operatively in New Brunswick has been largely confined to the efforts of the New Brunswick Agricultural Societies United. This organization has been established for some few years, and has been supplying fertilizers through agricultural societies. The success of the movement is beyond question. The price of the fertilizer to the consumer has been reduced very considerably, but there is still a lack of appreciation on the part of the farmers of the advantages to be derived from pooling their orders and buying in the cheapest market.

Another attempt at organization was made through *The Maritime Farmer* to supply mill feeds and flour at cost. This movement has been vigorously opposed by most of the milling companies and retail merchants. The farmers during the past few months have been organized in all parts of the province to buy flour and feed for delivery in the fall of 1918.

If the millers will not come to terms, it is anticipated that small flour mills will be erected in many parts of the province, and various farm organizations will bring their wheat from the West and grind their own flour. Many of these mills will be run co-operatively, so that the farmers will derive full advantage from all earnings. Farmers are beginning to realize that their flour purchase will prove an important factor in conditions next fall, and in sections the entire membership of the agricultural societies have pledged themselves to order from only such mills as are prepared to recognize the farmer's money as well as the middleman's.

It is felt that co-operation in New Brunswick will eventually attain the same growth as it has in Nova Scotia, where the movement is quite strong.

ONTARIO

BY F. C. HART, B.S.A., DIRECTOR, CO-OPERATION AND MARKETS BRANCH

THERE are between 300 and 400 farmers' clubs in the province, and a considerable proportion of these are doing co-operative business, mainly in the purchase of supplies. Most of these clubs are unincorporated, and are simply a means by which the farmers of a community may group their orders for supplies. I should state, however, that an increasing number of these clubs are becoming incorporated, as they realize the benefit of having a legal status. There are very few other organizations organized primarily for the purchase of supplies. A large number of producing organizations carry on the purchase of supplies with their other activities.

Where an organization is incorporated it is usually financed either by means of share capital or on the capital note system, that is, each member gives a demand note to be used as collateral in the purchase of supplies, or for other business. The unincorporated clubs, or organizations, raise capital either by means of these individual notes of the members, a joint and several note of the members, or a joint and several note of the officers of the club. In some instances also, members are required to pay cash when they give their order, so that payment may be made for goods immediately on arrival.

An illustration of the method by which some few clubs operate through the local dealers is that they club their total orders, say for seed, and ask for tenders on the bulk order; the local seed merchant receiving the order fills the individual orders at his own store and takes payment in cash. This obviates the difficulty of the secretary keeping books and doing the detail work necessary in filling orders. It is, of course, not always possible to do the work in this way.

In handling the supply business many of the clubs pay no attention to the dealers' prices of the goods the club is handling. Goods are purchased at wholesale prices, and are re-sold to members of the club at a slight advance to cover any small expense of managing the club. This results in price-cutting on local dealers. In many instances, also, because of unforeseen expenses, the small margin taken by the club over the wholesale price is not sufficient to cover expenses, and many of the clubs are beginning to realize that it would add to the permanency of their business if the local price were charged to members, and that the profits thus created were returned to members in proportion to the amount of business done. A number of the organizations are now doing business on this basis, with much better satisfaction both to members and to the trade.

A number of the clubs are purchasing what is known as shelf goods, that is, the small articles that are handled by the general store-keeper. Because of less expensive business in the plant of the clubs, they are able to undercut the prices of such local store-keeper, and, from the experiences of some districts, it would appear desirable to eliminate this class of business until such time as the club is in a position to establish a store of its own.

The co-operative purchase of seeds, feeds, binder twine, and such as are raw materials necessary for the farmer and can be purchased in wholesale quantities, are legitimate and profitable lines for a co-operative association to handle.

UNITED FARMERS OF ONTARIO

BY J. J. MORRISON, SECRETARY

CO-OPERATIVE purchasing of requirements in Ontario, like co-operative selling of products, is in an experimental stage. The people, in seeking relief from economic pressure, have embraced the bald idea of co-operation, much the same as a wayward individual might embrace prayer for immediate and specific relief from the pending result of thoughtless or deliberate violation of moral or physical laws.

Co-operation being a system rather than a dogma, its most successful principles will be evolved from experience in the application of various procedures in reaching its objective. The people, in seeking this objective, must, like a surveyor, be prepared to follow the best course available, to double back if insurmountable obstacles are met with, and, perhaps, take a new course, ever keeping before them their objective and their determination to reach it, by whatever means the great teacher "experience" may indicate.

The United Farmers of Ontario, in seeking this objective, proceeded with the belief that enlightenment was one of the greatest essentials toward success, that organization would lead to enlightenment, it in turn to unity of thought and action; but all men not being equally enlightened, therefore, the greatest incentive to organization or co-operation is remuneration for the effort put forth. Thus commercial activity becomes a strong factor in this co-operative endeavour.

The economic pressure in the purchase of supplies being the most apparent to rural producers, it naturally assumed precedence over the sale or distribution of their products, as the line of least resistance and of immediate results.

In order to bring this about it was found necessary to form small groups of men who desired to co-operate, or merge their purchasing power, that all might benefit from the consolidation of interest. These groups of men are called clubs, and are the first stage in the active co-operation of the United Farmers of Ontario.

BUSINESS POLICY AND METHODS

Business policy immediately becomes a function and a necessity, but, to a people unskilled in business and undecided as to their requirements, it again becomes necessary for every new group or club to evolve its own business policy. Other clubs can only advise, because adherence to the movement being purely voluntary, recognition of their autonomy in individual club effort is imperative. Gradually their policy of purchase and finance is becoming established, just as established business methods are followed by the commercial world.

Briefly, the clubs meet periodically, place their orders with their secretary, who places their combined orders with the central office, which is to the clubs their supply house. The goods ordered are shipped by the central office to the secretary c.o.d. The local club generally has a bank credit established by collateral note, or other security, on which the secretary and president of the club can draw by cheque as necessity requires. Clubs may distribute goods received at retail prices, and pay a dividend to their patrons, or they may sell at cost of purchase, plus distribution charges, as in their discretions is most desirable; central office does not interfere, although the former plan is apparently attracting the attention of many individual members. Orders for supplies are all voluntary. Soliciting for the same has not yet been practised by either the central or the club. The central sends quotations periodically to clubs, but does not solicit orders.

The goods are distributed by the secretary or manager of the club from the car, or from the club store-

house, which is becoming a necessary and not an uncommon adjunct of the club.

ORGANIZATION AND EXTENT

The United Farmers of Ontario is an association governed by a board of directors elected in annual convention. All organizational and educational work is promoted by the U.F.O., which now comprises about 15,000 members and 400 organizations.

The United Farmers' Co-operative Co., Ltd., is organized under the Joint Stock Companies Act of Ontario. The authorized capital is $250,000, divided into 10,000 shares of $25 each. These shares are sold to members of the United Farmers of Ontario and form the capital stock of the company. The by-laws provide for one man one vote, and no proxy voting. Shareholding is limited to not more than ten shares to one individual. The shareholders number over 1,000. Business is transacted on a cash basis, and has advanced from less than $1,000 in 1914 to over $1,000,000 in 1917.

Extension of the business, embracing the sale of various products of the farm, has been introduced, and will be further developed as necessity demands, until all departments of the agricultural industry are covered. Competent managers will be placed over each department with a general manager over all. By this means, the cost of production and of distribution will be lessened, leaving greater rewards to be divided between producer and consumer.

Agriculture will become more profitable, labour will gravitate to the land. It will not be found necessary to exhort women, children, and old men to return to the land. Agriculture will become a self-sustaining, self-respecting industry.

VINELAND GROWERS' CO-OPERATIVE ASSOCIATION

BY W. M. GAYMAN, SECRETARY

IN almost every community where twenty-five or more farmers are located, you will find a feed store or a mill, a grocery and hardware store, and a farm implement dealer. These various businesses are, in many cases, handled very efficiently, and in many other cases the opposite could more accurately be said of them. It is surprising in looking up the financial rating of a vast number of these smaller concerns to find that credit is poor, and that they have not sufficient capital to enable them to buy any of the commodities they handle in carlots. The farmers in the above particular community are clearly not being served as efficiently as is their privilege. In other cases, the dealer may be financially strong. If he is acquainted with the market, he knows the best time to buy. He buys at this time and in large quantities, but instead of giving his customers the benefit of the good bargain, he may sell at the later higher market price, and thus make so much larger profit for himself. Let these same twenty-five men form a stock company. Each man should subscribe for one hundred, two hundred, or five hundred dollars' worth of stock, according to the amount of business it is hoped to handle. This will give three to five thousand dollars capital. The appointment of the directors is the next important item. Seven farmers who have made a success in their individual farming make good directors.

If the business is large enough, it will be necessary to hire a manager. In our company each member is bound to place his order for all supplies through the secretary. This gives him a chance to buy in large quantities. Each member should give the secretary an idea of the approximate amount of goods he will require. If the business will warrant

a warehouse along the railroad siding, it will always be a valuable asset, and will be of great assistance in distributing supplies. If the warehouse cannot be built the first year, a temporary building can be rented. In our company last year we purchased supplies to the value of $62,000. We dealt in coal, feed, sulphur and spray materials, baskets and crates, cedar posts, nursery stock, hay, and straw. These were sold to our members at fair market value. Our gross profits exceeded five thousand dollars.

DUNDAS CO-OPERATIVE ASSOCIATION, LIMITED

BY R. H. ASHTON, SECRETARY

THE Dundas Co-operative Association, Limited, was organized in the year 1915 under the laws of the province of Ontario, with an authorized capital of $10,000.00, divided into five hundred shares of $20.00 each. The objects of the association are to produce and market and to buy, sell, and deal in farm products, and to buy, sell, own, control, and deal in farm supplies, machinery, buildings, and land as needed in its business.

EGGS AND POULTRY

The business policy, with respect to handling eggs, has been to advance to the farmer the local market price as near as possible when the eggs are collected or delivered at the candling station. Each individual lot of farmer's eggs is graded, and the farmer is credited with the quantity falling into each grade. The eggs are then sold for the members, and after payment of all expenses the profits are divided among the farmers by way of a co-operative dividend, not on the amount of share capital each has invested but according to the quality and quantity of eggs sold through the association during the year. Only shareholders are actually entitled to participate in the co-operative dividend, but in order to demonstrate to the farmers the principles of co-operation, the advantages and privileges of the association were extended to all farmers selling through the association during the year 1917. The result has been that more stock has been taken up and a greater interest is now being manifest in the association. Poultry is handled in a similar way to eggs. In the handling of feed, it is considered better to charge the local retail price so as not to antagonize the local retail dealer, and, after payment of the expenses, the profit is divided among the farmers annually by way of a co-operative dividend on the amount of feed each farmer buys through the association.

METHOD OF FINANCING

The financing is done through the bank by promissory note, and by an assignment of the unpaid portion of the stock subscribed for as collateral, and by hypothecation of warehouse receipts issued from the local cold storage on produce stored.

No attempt has yet been made by this association to purchase other supplies, but the question is a very important one, and has been considered by the management. If entertained, the business will be handled on the same principles as eggs and feed. When the farmer thoroughly understands co-operation, and that it is to his financial interest to buy or sell through a co-operative association, there will be no difficulty in getting orders through a proper mail order system. By that method will be saved the expense of house to house canvas by agents.

The business of the association has grown since the year of its inception, 1911, from $3,243.10 to $94,-933.63 in the year ending December 31st, 1917.

LEEDS FARMERS' CO-OPERATIVE COMPANY

BY THOS. J. WEBSTER, LANSDOWNE

THE Leeds Farmer's Cooperative Company, Limited, is a joint stock company with four hundred shares, each representing $25, payable at the rate of $5 per annum. When it is necessary to have more money for a short period, the executive give a joint note. They usually buy f.o.b. Lansdowne, with draft attached to bill of lading. Each branch has a local agent, who canvasses the members of the branch to ascertain their requirements. Having obtained this information, he sends it on to the sales manager, who buys for all the branches to the best advantage. Last year was our first. We bought for our members clover and timothy seeds, feed corn, oats, mill feed, bran, middlings, oil-cake, flour, and poultry, to the extent of $53,573.44. We charged 2 per cent. for handling these goods, which covered all the expenses, and left a surplus that was added to the general account. We are extending the business of buying this year by adding coal, fencing, binder twine, and other lines that appeal to the executive.

HAWTREY FARMERS' CLUB, OTTERVILLE

BY CHAS. H. PEMINGTON, SECRETARY

REGARDING co-operative work here might say that we formed our club with the intention of buying our supplies, mostly feeds, in carlots. Our nearest mill will only supply 500 lb. of shorts, and less of bran, at one time, and this will only partially supply the community's needs, let alone the amount of driving necessary to procure such small amounts. We have experienced no trouble in securing cars of feed until the past two months. In addition to feeds we have purchased some seed.

We have arranged a credit with our local bank by each giving a note for one year to use as security in releasing cars shipped to us. Each member is required to pay for his goods at the time of delivery, so that our account at the bank is cleared in a few days.

Our method of securing orders is for the most part by phone, though some of our orders are taken at the meetings at that time. When the orders approach a carload, we generally purchase, and the balance usually is spoken for in the time between ordering and delivery. In delivery, the phone also serves, and we all plan to unload at one time, and we pay one man to look after the unloading on that day.

We organized our club about a year ago, and since then have ordered between $4,000.00 and $4,500.00 worth of feeds and seeds, and would have done nearly as much more had we been able to secure the seeds the past two months. We not only save on our purchase, but save almost as much on our haul.

We find that in order to give our members proper service, we should have regular shipments ordered considerably in advance of requirements, and this would require a small storehouse for portions of cars not sold at the time of the arrival of the car. The store house could be opened, say, once a week at small expense. We are also beginning to co-operate with other clubs of neighbouring localities in making up carlots. This last might easily be developed to quite a considerable extent, especially benefiting the smaller clubs.

LAMBTON COUNTY CO-OPERATIVE ASSOCIATION

BY AMOS GROH, MANAGER, PETROLIA

THE Lambton County Co-operative Association is organized for the purpose of selling farm products, as well as for purchasing supplies. However, we have not yet finished our first year's work, and are not far advanced in selling lines, perhaps not over $20,000 of the $100,000 turnover comes under sales. The first season's work, from a financial standpoint, has been quite satisfactory, the association having established itself during the summer months, and closed its books after 8½ months' business with not a penny of debt, but with a light favourable balance. But the balance sheet is not the test of this organization. It has entered the test to see if a real co-operative system can be established. Its task is a psychological one, the task of changing the mental attitude of its members from the bargain-counter type to that of a real moral, social, and economic factor in rural life. If this can be done (and it is being done), the solution of the economic problem cannot fail to be apparent on the right side of the ledger.

The organization, as its name indicates, is designed for the county. Its members consist of such farmers as have signed a $25.00 note designed for the purpose, made to the credit of the organization. The notes thus signed are deposited in the bank, with proper papers hypothecating their value, as security for such sums of money as the association may require to carry on its business. Nothing in the form of cash is required from the members to carry on the business of the association, except prompt payment for such goods as they may purchase through it, unless perchance the management should lose money in bad deals.

Any five or more members, with the sanction of the central board, can organize a local club. These various clubs in the township elect representatives to the county board, which organizes the central board, whose business is the general management of the association's affairs. The central office negotiates for supplies and reports periodically to the secretary of the local organization, who keeps in touch and receives such orders and requests as his club may be interested in, and places the same before the central. In normal times much of this work would consist of shipments of carlots of supplies, such as feeds, fertilizers, salt, coal, sugar, flour, cement, fencing, fence posts, binder twine, potatoes, fish, and much in less than carlots, which would be unloaded direct to the members of the various clubs around the shipping point.

I have not been long enough at work to be able to give figures of the year's work, but the progress made is quite promising, both in increased organizations and in additional notes sent forward. There is also evidence of a hearty acceptance of the real principles of co-operation.

LENNOX AND ADDINGTON

BY G. B. CURRAN, B.S.A., AGRICULTURAL REPRESENTATIVE

ALL the farmers' co-operative associations in Lennox and Addington county have been formed under the Ontario Companies' Act as a non-share company with capital notes. Each organization has received a charter from the Ontario Government, and when applying for the charter they have taken out a charter giving them the right to both buy and sell all kinds of farm products or supplies. In a district where the farmers wish to organize a co-operative association a public meeting is called, and if enough farmers decide to organize a co-operative association five men are elected to apply for a charter. The cost of

obtaining a charter is $10.00 Government fee, and in our case $10.00 for the lawyer's fee. As soon as the charter and by-laws are received, an organization meeting for the election of directors and officers is held. Only members can vote, and, therefore, before any officers or directors are elected all those in the meeting must pay their membership fee, or else take no further part in the meeting. This rule has been forced very strictly at all our organization meetings, so that farmers who do not intend to join, or kickers, cannot obstruct the proceedings. The membership fee in all cases is one dollar per year.

THE BUSINESS POLICY

The first rule of all our co-operative associations is that goods will be ordered and sold only to members. If any farmer wishes to get the benefit of the co-operative association's purchases he must become a member. To become a member each applicant must pay a yearly membership fee of one dollar, and sign a capital on demand note for $100.00. The application is then passed upon by the directors, and if approved the farmer is listed as a member. The capital notes are taken to the bank and deposited as collateral security. The bank will advance at any time 75% of the face value of these notes. Most of our associations have at least 60 members, so that they have a credit of $4,500.00.

However, if the association orders a carload of corn, which is worth approximately $2.000.00, the manager takes the sight draft to the bank, and the bank advances $2,000.00. The association charges $1.00 per ton for handling feed. Thus if a car contains 30 tons the association will receive above the sight draft value $30.00. Each farmer that has ordered feed goes to the bank and pays in for the amount he has ordered, and receives a slip from the bank authorizing him to get his amount of feed from the car. The bank has a list from the manager, and only accepts the amount of money specified on this list. The farmer takes his bank slip to the car, gives the slip to the manager, and the manager gives him the amount of feed called for. In this way, when the car is unloaded the feed is all paid for, and the association has, in this case, $30.00 more to its credit than in the morning. From this $30.00 must be deducted the manager's expenses and cost of loan by bank.

The bank charges 7 per cent. interest on the amount of the loan for the number of days the association has the money borrowed. As the sight draft is not paid until the car has arrived in the station, and the car is always unloaded within 48 hours after it has arrived in the railway yards, the interest to the bank is usually only for one or two days, and is, therefore, a very small item of expense. By having the farmers pay in their money at the bank instead of at the car, the work of the manager at the car is very much simplified. Another advantage is that if a farmer has not the ready cash to pay for his feed he can step in to the manager of the bank and arrange for a loan on his personal note, and step out to the teller and pay the association in cash without going outside of the bank building. In cases where there is no bank in the same town where the car is unloaded, the money has to be paid at the car door. By the above method of financing, farmers pay for their feed when they get it, the same as when they go to any feed dealer or store.

METHOD OF SECURING ORDERS AND THE DISTRIBUTION OF GOODS

Each association has a manager whose duty it is to receive orders and to superintend the unloading of goods at the car. All orders must be given to the manager in writing. If phone orders are given the Associaton

will not be responsible for any mistake. Each farmer wishing to order feed sends in his written specifications of the amount he wants of the various kinds of feed, and the approximate date he needs it. The manager totals up these amounts, and orders a carload as soon as he has received sufficient orders. Members are requested to send in their orders two weeks to thirty days in advance of their requirements. When the goods arrive, the manager notifies each member who has ordered goods in writing telling him to appear at the car on a certain date and take delivery of his goods. By this method, all cars are unloaded within the specified time, 48 hours. In fact, all have up to this time been unloaded the first day.

BUSINESS TRANSACTED DURING THE PAST YEAR

Owing to the fact that the first association in this county was organized December 1st, 1917, our seven associations are all very young. However, each association has now unloaded a car of feed corn secured from the Feed Branch, Dominion Department of Agriculture, and one or more carloads of bran or shorts, and approximately $25,000.00 worth of business was transacted during January, February, and March. The associations are also planning to handle a carload of binder twine, a carload of seed oats, and a carload of seed potatoes, and intend to buy during the summer and early fall months sufficient feed to last their members all next winter. The associations also decided to ship hogs co-operatively. The first shipment recently went out, and was satisfactory in every way to the members. Future shipments will be made whenever sufficient hogs are supplied by the members to fill a car.

PLANS FOR THE FUTURE

The work of buying farm supplies through co-operative associations has been perfectly satisfactory in every way, and the only plan for the future is to continue to expand the business and, whenever thought necessary, to purchase additional lines of farm supplies. The associations are considering seriously the marketing of farm supplies, and particularly the shipping of carloads of hay and gr in. From present indications, the farmers' co-operative associations will continue to grow in strength and importance until they are serving a vast majority of farmers in the county of Lennox and Addington. We have discovered some splendid business men and leaders among our farmers' co-operative associations, and with men of such quality interested in this new line of work there is no question in my mind but that this work will be a success.

THE SITUATION IN THE PRAIRIE PROVINCES

IT would seem that, with the exception of binder twine and occasionally coal, lumber, flour and perhaps a few other commodities, very little is done by the locals of the Grain Growers' Association or of the United Farmers of Alberta. No doubt in a few instances, where a number of farmers have grasped the real idea and genuine advantages of buying co-operatively, arrangements are made to lump orders and buy in carlots through the local secretary of the association. In Alberta and Manitoba, a whole lot of this kind of buying is now done through the elevators, and not through the secretaries of locals of the other associations. In Saskatchewan, special co-operative associations

have been incorporated at many points, and these have taken over the purchase of supplies.

WORK OF THE LOCAL ASSOCIATIONS

There is a tendency to differentiate between the local associations that have been formed for social and legislative work and those that look after the farmers' business. Of course, since the elevators and the incorporated associations that exist in the three provinces do not cover as much ground as do the locals of the associations, a certain amount of buying through these locals still continues. Many of these locals, and also a number of the incorporated associations in the three provinces, place their orders with the central company. The central office of the Saskatchewan Grain Growers' Association has also constituted itself into a trading institution. Many of the incorporated associations in that province deal with that central, but not all of them.

THE METHOD OF OPERATION

The company has elevators at over 300 points in Manitoba, Saskatchewan and Alberta. At each point the elevator agent, in addition to looking after shipments of grain and live stock, or handling grain through the elevator, tries to assist the farmers of the locality in whatever way he can in regard to their purchases of machinery and other commodities. This business is done on an entirely cash basis, and local associations, when placing their orders as an association, can make arrangements for the financing of them in whatever way they see fit. If they have a real live association, properly organized, there is little difficulty experienced in arranging with the banks for payment of a carlot of goods on arrival. A common practice is for twenty or thirty or forty farmers each to sign a demand note for a given amount and the bank will hold these in connection with financing such purchases as are previously referred to. In case of incorporated companies, they, of course, have a certain amount of paid-up capital, and arrangements are made for a line of credit at the local bank.

In regard to soliciting orders, most of the work is done at a meeting of the members, or by sending out letters. In many localities, practically every member has a telephone, and the secretary can easily arrange to take orders over the phone.

THE PAST YEAR

Information is not available to make a statement respecting the volume of business transacted during the past year. Some associations have had more than $100,000 of a turnover; in one or two cases close to $200,000 has been reached, but this included shipments of live stock as well as purchase of commodities.

SASKATCHEWAN

BY W. W. THOMSON, DIRECTOR, CO-OPERATIVE ORGANIZATIONS

CO-OPERATION in the purchase of farm supplies is carried on, perhaps more extensively in Saskatchewan than in any other province of the Dominion, but the great bulk of this work is done by the agricultural co-operative trading associations, and by the local grain growers' associations, rather than by organizations directly supervised by the provincial Department of Agriculture. Since the province was granted autonomy, the provincial Government has con-

sistently encouraged the organization of co-operative producing, purchasing, and marketing associations as a solution of many of the difficulties confronting the agricultural community, and, as a result, the province today possesses a well-organized system of co-operative trading bodies. At the present time there are in the neighbourhood of 1,400 local grain growers' associations in Saskatchewan, and these had a total membership of 23,792 persons during 1917. These local bodies do a very large amount of collective purchasing through their central trading organization. The 1918 annual report of the associations' central executive shows that during 1917 the trading department handled supplies to the value of $1,643,000.

There are also upwards of 365 co-operative associations registered under the Agricultural Co-operative Associations Act of 1913. These are incorporated trading bodies in which shareholders have the protection of limited liability. They are financed by the sale of share capital, distribute their profits on a patronage basis, and are controlled on the one man one vote principle. They handle flour, feed, coal, binder twine, building material, and practically all kinds of farm supplies. All goods are bought and sold for cash, and very material savings are effected.

THE GROWTH

The table which follows shows the development of these bodies since they first came into being in the spring of 1914. Reports for 1917 are not yet complete:—

Year	Associations	Number of Shareholders	Paid up Capital	Value of Supplies handled
1914	102	2850	$13,494.20	$239,320.42
1915	173	5537	39,421.49	805,456.88
1916	309	9444	92,940.27	1,984,545.85
1917	367	—	———	———

LIVE STOCK BUYING

In addition to the co-operative purchasing carried on by the trading organizations just described, a considerable amount of co-operative buying has been done through the live stock and other branches of the Saskatchewan Department of Agriculture. During the past five years, the Live Stock Branch has purchased large quantities of both pure-bred and grade cattle and sheep with funds provided under the provincial Live Stock Purchase and Sale Act. These animals, many of which were purchased outside the province, were sold at actual cost, either for cash or on a part cash and part credit basis, to farmers throughout the province, thus enabling many stockmen to lay the foundation of herds and flocks, and building up the live stock industry.

The following table gives the number of the different kinds of live stock distributed during each of the past five years:—

	1913	1914	1915	1916	1917
	—	—	—	—	—
Pure-bred Bulls	19	41	84	150	101
Pure-bred cows	18	14	12	6	15
Grade cows and heifers	345	483	363	342	1267
Pure-bred rams	—	13	35	10	33
Grade Range Ewes	1000	482	2120	852	3415
Total distributed for year	1,382	1,033	2,619	1,360	4,831

The provincial Live Stock Commissioner, in his capacity as secretary of the Saskatchewan Sheep Breeders' Association, has annually purchased and sold at cost sufficient quantities of sheep dip and branding fluids to meet the needs of the sheep men of the province. Paper twine for tying fleeces of wool and well woven jute sacks suitable for shipping wool have been supplied each year to sheep men at cost by the Co-operative Organizations Branch in connection with its co-operative marketing project inaugurated in 1914.

CO-OPERATIVE CREAMERY OPERATIONS

In connection with the operation of the co-operative creameries of Saskatchewan, the principle of co-operative buying has been in operation for several years. These creameries, which now number about twenty, have been under the direct control of the Dairy Branch since the year 1906. During these years the cream cans, butter boxes, paper, salt, fuel, and other supplies have been purchased on the co-operative plan, and the farmers who are the principal owners of these creameries have received the benefit of the savings made, which, during these years have amounted to a considerable sum.

ALBERTA

BY C. RICE JONES, PRESIDENT OF THE FARMERS' CO-OPERATIVE COMPANY

THE business of the co-operative department of the Alberta Farmers' Co-operative Elevator Co. increased during last year beyond all expectations. The department handled during the twelve months ending August 31st, 1917, a total of 2,691 carloads of supplies, as compared with 998 cars the previous year, not taking into consideration a considerable amount of goods handled in less than carload lots. The total turnover in dollars and cents was $1,519,984.33, more than twice the volume handled in the period ending August 31st, 1916, which covered thirteen months, and nearly three times the volume handled in the corresponding period for the previous year, when the turnover amounted to 828 carloads, of a value of $532,734.11. In terms of carlots, the supplies handled were as follows:—

Material.	Carloads.
Binder Twine	91
Barb Wire	68½
Fencing and Gates	6½
Bale Ties	1
Salt	36
Flour and Feed	151
Posts and Poles	304
Cordwood	11
Hay	169
Lumber	320
Coal	1519
Fruit	14
	2,691

BRITISH COLUMBIA

BY WM. E. SCOTT, DEPUTY MINISTER OF AGRICULTURE

A CONSIDERABLE movement has been made by our farmers during the past few years towards organization along co-operative lines for the protection and advancement of farmers' interests. The provincial Government have always made a point of encouraging co-operative effort along good sound business lines by our farmers, and in order to help them towards organization provision has been made in the "Agricultural Act, 1915," for the formation of farmers' co-operative associations.

Part II. of the Act deals with

incorporations without share capital, where the incorporated association has a yearly subscription. Under this part of the Act, farmers' and women's institutes, agricultural fairs, associations, fruit growers', poultry, dairymen's, and live stock associations have been formed.

ACTIVITIES OF FARMERS' INSTITUTES

Farmers' institutes have done a considerable amount of co-operative work along the lines of purchasing the supplies necessary for farmers in manufacturing the finished product of the farm. Most of our farmers' institutes now bring in feed stuffs such as bran, shorts, grain, etc., by carload lots and distribute them to members at cost. This work has rapidly spread during the last few years, and has saved our farmers many thousands of dollars.

In the case of organizations without share capital, such as farmers' institutes, they finance this work on a strictly cash basis. Farmers inform their secretaries as to the quantities of feed stuffs that they require and hand in the cash. A carload is then secured at the lowest possible cost, and on arrival is distributed forthwith to the farmers who made up the order. Other supplies are brought in in addition to food stuffs, such as fencing material, spraying mixtures, farm machinery, etc.

Part III. of the Act provides for the incorporation of co-operative associations with share capital. A considerable number of such associations are now incorporated in the province. They consist principally of creameries and fruit growers' associations. These organizations also do a considerable amount of business in the way of co-operative buying of farmers' supplies. The method in which the business is transacted is along similar lines to farmers' institutes, and as a rule the financing is done on a cash basis. In some instances, however, accommodation is afforded through the banks.

OTHER OPERATIVE ASSOCIATIONS

These associations formed under Part III. of the Act also market farmers' produce on a co-operative basis, and in this direction the main energies of these associations are concentrated. Excellent results in co-operative marketing have been secured by our creamery associations and by the fruit growers' associations, especially in the principal fruit growing districts, and the extent of the business carried on by them is very considerable.

The Okanagan United Growers, Limited, an organization of fruit and vegetable growers in the Okanagan Valley, does a large business in the Prairie Provinces, and to a less extent in our coast cities. By means of this organization fruit growers have been able to get away from internal competition, and consequent cutting of prices, and have been able to market their produce for far better prices than in the days previous to this good co-operative undertaking. The benefits received by the organization of farmers and fruit growers along co-operative lines are plainly obvious in the results that they have obtained, and, as a consequence, the movement is rapidly spreading throughout the province. The chief value of the work lies in the fact that by means of these organizations farmers are prevented from selling one against the other, with the inevitable lowering of prices which is entailed by individualistic action of this nature. By purchasing supplies, they save a large amount of money, and in marketing their produce they get far better prices than would be possible under the unbusiness-like individualistic method previously followed by farmers.

FIELD CROP COMPETITIONS

It is interesting to note in connection with the following series of articles containing conditions for field crop competitions in different provinces, that the funds required are at least partially derived from grants under The Agricultural Instruction Act of Canada. For field crop and poultry judges and short courses, Ontario devoted $4,703 of its appropriation under the Act; Quebec devotes $9,000 to seed selection, clover plots and demonstrations of the nature of which these competitions partake; Saskatchewan devotes $5,000 of the funds to field husbandry and weed control, and British Columbia places $8,000 from the same source to the credit of field crop demonstration stations.

QUEBEC

THE Minister of Agriculture for the province of Quebec has announced a special grant to agricultural societies which intend this year to hold standing crop competitions. The objects of the grant are stated to be:—

1. To stimulate the farmers in the growing of choice seed grain;
2. To encourage the practice of growing seed for next year's crop separate from the main crop, using only the best obtainable seed, sowing it on the best prepared land and the cleanest, allowing it to thoroughly ripen, and threshing and storing separately;
3. To obtain pure grain, i.e., free from other varieties, the presence of which can best be detected when the grain is growing;
4. To encourage the use of seed from heavy yielding strains;
5. To promote the sowing of seed from clean, vigourous crops of uniform stand and with bright stiff straw, in the case of smaller cereals;
6. To encourage careful and intelligent farming and the production of grain free from weed seeds.

THE REGULATIONS

The regulations governing the competitions are as follows:—

1. Competition shall be limited to one crop, to be selected by the society, which should be one of the most important to the farmers of the district. Entries for competition must consist of a field not less than three acres, and where clover, potatoes and timothy are entered, the minimum plot not less than one acre.

Selection must be made from the following crops, viz., wheat, oats, barley, corn, peas, clover, timothy and potatoes.

2. Competitions shall be limited to the members of agricultural societies. Competitors shall be allowed to make entry in only one society and but one entry can be made by each competitor.
3. Societies desiring to enter this competition must notify the secretary of the *Council of Agriculture before the first of May*, and must not make more than 25 entries.
4. The list of the competitors shall be transmitted to the secretary of the Council of Agriculture *before the first of July*.
5. Societies must charge competitors an entry fee of not less than 25 cents and not more than one dollar.

PRIZES

The Department of Agriculture will grant $75 to each of the societies, to be employed in paying prizes of not less than $20, $15, $12, $10, $8, $6, $4. The grant will be equal only to the amount paid for prizes, if it is below $75. Prizes will be awarded by the judges only to fields deserving. The fees received with the entries will be equally divided amongst the successful competitors, in addition to the special grant. If the number of competitors is less than ten, the prizes will be: $10, $8, $6, $4, $2, $1.

The plots will be visited by judges appointed and paid by the Department of Agriculture of Quebec, and the secretaries of the agricultural societies who will organize such competitions are required to advise the Secretary of the Council of Agriculture at least 15 days before the contest will be held, of the dates when the judges will be required.

ONTARIO

THE Superintendent of Agricultural Societies, Mr. J. Lockie Wilson, has announced the following conditions for this year's standing field crop competitions:—

1. Societies can enter two crops, to be selected by the Board of Directors. Each field entered must consist of not less than five acres nor more than twenty in one block; but for beans, potatoes, mangels, turnips, clover or alfalfa, the minimum plot must be not less than one acre. In Northern Ontario, the minimum for grain will be three acres, and for roots one-half acre.

If a field contains more than five acres and the competitor wishes to reduce it to the minimum acreage allowed, it will be necessary for him to either cut a swath between the part to be judged and the balance of the field, or set a row of stakes not less than four feet high for a division line. Unless this is done the judge will be required to score the whole field.

Selection must be made from the following crops, viz.: spring or fall wheat, white oats, barley, rye, flint corn, dent corn, peas, alsike clover, red clover, alfalfa, potatoes, mangels, turnips, beans, or other staple crop grown for seed in Ontario.

2. Competition will be limited to those who are paid-up members of an agricultural society for the current year, and fields entered should be not more than fifteen miles from its headquarters. Competitors will be allowed to make entry in *one society only*, for one or two varieties of crop, and only one entry can be made by each competitor in each kind of crop. *This rule must be strictly observed.* A father and son residing on the same farm cannot make separate entries.

3. Societies desiring to enter this competition must notify the superintendent not later than the first day of May, except for corn, the latest date for making entry in which will be May 15th. *Not less than ten bona fide entries for each crop in any society will be accepted.*

4. Individual entries must be forwarded by the secretary of each society on or before May 25th, 1918, except entries for corn, which can be sent in up to June 15th.

5. A society may charge an entry fee of not more than one dollar for each crop entered by a competitor, but this is optional with the directors.

6. The Government grant to a society for each crop, except spring wheat, will be $50, making a total grant of $100 if two crops are entered. This amount must be supplemented by the society to the extent of $25 for each competition. In the event of one crop being entered, the total amount of prize money offered will be $75; for two crops the prizes to be awarded will be $150. In order to encourage the production of spring wheat the Government grant to a society for this crop during 1918 will be $75, which, supplemented by the society's $25, makes a total of $100 in prize money for spring wheat alone.

7. Seven prizes must be offered as follows: for each crop, except for spring wheat: first, $20; second, $15; third, $12; fourth $10; fifth, $8; sixth, $6; seventh, $4. *These must be paid in full to the winners without any deduction.*

For spring wheat the prizes will be: first, $25; second, $20; third, $16; fourth, $14; fifth, $11; sixth, $8; seventh, $6.

8. The secretaries of societies should urge competitors in the different crops to select, if possible, the same variety of grain or other crops, and have them sown as nearly as possible during the same week. By so doing the crops will ripen more evenly and the work of the judge be facilitated.

9. The Ontario Department of Agriculture will furnish judges free of charge.

SASKATCHEWAN

BY S. E. GREENWAY, DIRECTOR EXTENSION DEPARTMENT

THE Dominion Seed Commissioner has suggested some very desirable modifications in the method of conducting standing crop competitions. They consist chiefly in making it compulsory for the competitor to grow crops from seed wheat which meets with the approval of a provincial seed board, and, as soon as practicable, that prizes shall be paid only on eed crops grown from approved seed stocks. These and other valuable suggestions will, in the interest of good seed, be ultimately adopted, but whether they should be adopted immediately is perhaps a matter for further discussion. There would

seem to be something that might be said in favour of the old system. Many farmers are wrongly convinced in their own minds that certain varieties and certain crops are best. Scientific opinion may see it otherwise. Would it not be the more direct way to attain the end sought by taking the farmer into his field and pointing out to him the limitations of wrong choice and methods? Compulsion might merely keep him from being an entrant.

METHOD OF PROCEDURE

The plan followed in the past is as follows:—

Any agricultural society or grain growers' association may earn up to $50 for each kind of crop up to five kinds, the word "crop" including grains, grasses, clovers, fodders, field roots, and garden stuff. In other words, any society can, by diversifying its field competitions, earn up to a total of $250 annually on account of its activity. In order to do so, however, it will be necessary for the society to award at least $375 in cash prizes, the grant paid being two-thirds of such awards.

The offer of these grants is figured to encourage societies and associations to adopt more generally this excellent activity, and to give recognition to the fact that the number, as well as the average, of our crops is increasing. Undoubtedly, the standing crops competition is one of the most profitable activities in which an agricultural society can engage. The skill of the farmer can best be judged from an inspection of his fields. It is there also that the proper cultural methods and the principles underlying the selection of good seed can best be brought home to the agriculturist.

THE CONDITIONS

The conditions of the competition are:

1. The fields of cereal crops shall be ten acres or more; the fields of grass five acres or more; alfalfa five acres or more for forage, one acre or more for seed; corn or roots for forage one acre or more. A separate prize list shall be offered for each competition to be held under the society.

2. Prizes to the amount of not less than $50 shall be offered for cereal crops, and $25 for the others. There may be four or more prizes in each competition, as may be decided by the society.

3. Fields entered for competition shall be situated in the district tributary to the headquarters of the society or association with which entry is made. The plots must be plainly marked off previous to the arrival of the judge.

4. Unless the society or association decides otherwise, the whole of the plot entered for competition shall consist of only one va iety of wheat.

5. Each competitor shall be allowed to make one entry only in each class.

6. The society or association shall decide the amount of entry fee to be paid to the secretary when making the entry.

7. The awards will be made by judges supplied by the Extension Department, College of Agriculture, Saskatoon.

8. Entries hall be made on or before July 15th to the secretary of the society or association.

9. The secretary shall mail to S. E. Greenway, College of Agriculture, not later than July 18th, a statement showing all entries made, arranged in the most suitable driving order for the judge.

10. The first or any other prize need not be awarded unless in the opinion of the judge the exhibit is worthy, and represents a proper choice of seed for the district.

GOOD FARMING COMPETITIONS

Conditions have never been favourable in Saskatchewan as yet for the furtherance of good farming com-competitions. At least, no amount of urging has carried conviction as to the desirability of the competition. The line of least resistance has been toward large cultivated areas and large cereal turn-outs rather than to farm home-making. In a few cases and in a few districts, an occasional farmer can be found whose chief interest is to put himself in a beautiful setting. His neighbour, who may for some reason be unable to give his time to adding beauty to his assets, does not feel like competing. This condition is general. At the same time it is fast becoming less noticeable.

The constant rural betterment which is going on largely through the agency of agricultural society activities—every ploughing match, summer-fallow competition, seed drilling competition, road-making competition, and standing crop competition—is taking on more and more some of the aspects of the good farming competition. That is to say, the whole tendency of rural betterment through one agency is gradually permeating the whole life of the farmer. There are lots of cases which might be cited, even in this new province, where slovenly farmers have developed the self-respect which is manifest in true culture, just because they got whipped at their first ploughing match a few years ago.

POINTS ALLOWED AND THEIR DIVISION

The score card at present used in this competition is as follows:—

DESCRIPTION.	Perfect Score	Actual Score
1—General Appearance	50	
2—Farmstead—110 points		
(a) House, grounds, and garden		
(b) Outbuildings and yards		
1. Suitability, convenience, and sanitation	50	
2. State of repair and location	25	
3. Water supply and location	25	
4. Workshop and appliances	10	
3—Windbreaks—40 points		
(a) Location	25	
(b) Kind of trees and condition	15	
4—Crops—200 points		
(a) Suitability	50	
(b) Condition	75	
(c) Freedom from weeds	50	
(d) Cultivated hay or crop	25	
5—Live Stock		
Horses—100 points		
(a) Breeding	50	
(b) Condition, care and management	25	
(c) Suitability	25	
Cattle—100 points		
(a) Breeding	50	
(b) Number	20	
(c) Feeding, care, management, condition	30	
Sheep—50 points		
(a) Breeding and care	25	
(b) Number and condition	25	
Hogs—50 points		
(a) Breeding and care	25	
(b) Number and condition	25	
Poultry—50 points		
(a) Breeding and management	40	
(b) Conveniences	10	
6—Machinery, Harness and Tools—50 pts.		
(a) Suitability	25	
(b) Quantity	25	
(c) Condition for age	25	
(d) Protection and provision for repairing	25	
7—Improvements—100 points		
(a) Disposal of manure	30	
(b) Fences and rotations	30	
(c) Neatness and thoroughness of cultivation	40	
8—Methods	50	
Total	1000	

BRITISH COLUMBIA

BY H. O. ENGLISH, CHIEF SOIL AND CROP INSTRUCTOR

FARMERS' institutes wishing to conduct field crop competitions in B.C. in 1916 and previous years were required to secure at least six entries before such competition could be held. In 1917 the minimum was raised to eight. The larger competitions were far more productive of good results, and it was decided in 1918 to raise the minimum to ten. This is the only change in the rules and regulations governing the open field crop competition.

Provision has been made, however, for the conducting of seed production competitions in 1918 with each of the principal field and garden crops. This work is being fostered by the newly organized B.C. Seed Growers' Association, and the prizes offered will serve as a bonus to the seed grower taking most interest in the work. In these competitions, classes have been provided for 23 crops, including grains, clover, alfalfa, vetch, corn, peas, potatoes, mangels, turnips, carrots, beets, rape, radish, onions, cabbage, lettuce, kale, parsnips, garden peas, and beans. The acreage varies from one acre with the field crop to ¼ acre with vegetable and root seed crops. The seed fairs provided for in connection with our field crop competition will be developed to provide prizes for all kinds of vegetable and the principal flower seeds.

RECENT AGRICULTURAL LEGISLATION

ONTARIO

At its recent session the Ontario Legislature passed two bills relating to agriculture, and adopted several amendments also relating to agriculture to Acts in the Revised Statutes of 1914. One of the Acts changes the name of "District Representative" to "Agricultural Representative." This bill is entitled "The Agricultural Representatives Act." It provides, as before, that such Representatives shall be graduates of the Ontario Agricultural College; that assistants and clerks shall be appointed as necessary; that the Representatives shall be under the control of the Minister of Agriculture; that the municipality shall pay $500 towards the expenses of the work, and that an accounting shall be made each year to the County Council.

PROTECTION OF SHEEP

The second bill repeals The Dog Tax and Sheep Protection Act in the Revised Statutes of 1914. The measure is still entitled "The Dog Tax and Sheep Protection Act." It provides, subject to the provisions of paragraph 9a, section 400, of the Municipal Act, for a tax of $2 on one dog, and $4 for each additional dog, and $4 for a bitch, if only one, and $6 for each additional bitch, owned by any one person. Any local municipality may, at any time, increase such tax. If a bitch is spayed the tax is to be the same as that on a dog. Owners of a kennel registered in the Canadian Kennel Register may pay $10 to the municipality as a tax on such kennel for one year, and for such payment the kennel is exempt from assessment and any further tax. According to the paragraph of The Municipal Act referred to, if the license fee equals or exceeds these taxes the latter are not to apply. The bill provides, as previously, for the collection of the taxes. Any person may kill any dog found pursuing, worrying, or wounding sheep, or that is found straying between sunset and sunrise. The owner of any sheep killed or injured is entitled to recover damages from the owner of the dog. If the owner of sheep killed or injured cannot recover from the owner of the dog, the treasurer of the municipality is to pay the aggrieved party the full amount ordered to be paid by the Justice on conviction, in addition to the cost of the proceedings. If the ownership of the dog is not discovered, the municipality becomes liable for compensation for the amount of the damages sustained, providing that application has been made for damages within three months after such sheep has been killed, injured, terrified ,or worried. The council of every municipality is required to appoint one or more competent persons to be known as sheep valuers. Within 48 hours after the discovery of any damage, the owner, of the sheep, or the clerk of the municipality, must notify a sheep valuer, who is immediately to proceed to make investigation and determine the extent of the damage. If the owner of the sheep considers the award inadequate, he can appeal to the Minister of Agriculture, who may name a competent arbitrator. The appeal must be made within a week after the award of the local valuer has been received, and must be accompanied by a deposit of $25, which is forfeited if the award of the local valuer is sustained. If the municipal corporation does not fulfill the requirements of the Act,

the person who has sustained the damage has a right of action against the corporation. The corporation can proceed against the offending party for its own benefit, but any excess of the amount claimed by the owner of the sheep that is recovered must also be paid over to him. If the sheep are killed or injured while running at large upon any highway or unenclosed land, the owner has no claim for compensation from a municipal corporation.

LAND DRAINAGE AND OTHER ACTS

By amendment to The Tile Drainage Act, Revised Statutes, 1914, instead of debentures being made payable twenty years from the first day of August in the year in which the money was borrowed, the time is to be reckoned from the date the debentures bear. The Department of Agriculture Act, Revised Statutes, 1914, cap. 45, is amended by striking out sections 9 to 17, inclusive, all of which refer to the Bureau of Industries. Section 32 of the Agricultural Societies Act, which confers authority to prohibit undesirable shows and performances, and forbids all gambling and games of chance at exhibitions, is amended by substituting the following for section 6, which made the penalty for violation of the section not less than $20 nor more than $100:

> Every person guilty of a violation of any of the provisions of this section, in addition to any other liability which he may incur thereby, shall incur a penalty of not less than $100, nor more than $300, for a first offence, and, in default of immediate payment of the penalty, shall be imprisoned for a period of three months unless the penalty or costs are sooner paid, and, for every offence committed after conviction for a first offence, shall be liable to imprisonment for a period of six months.

Section 3 of The Veterinary Surgeons Act, cap. 171, R.S., 1914, is added to by making all penalties recovered for illegal use of the title "veterinary surgeon," or for imposition connected therewith, payable to the treasurer of the Ontario Veterinary Association, to form part of the fees of the association, and to be accounted for as such.

APPROPRIATIONS FOR AGRICULTURE

Following are the appropriations for the years ending October 31st, 1918 and 1919:—

	1918	1919
Civil Government	$ 93,908.26	$ 91,200.00
Agricultural and Horticultural Societies	176,750.00	165,750.00
Live Stock Branch	56,693.74	51,850.00
Institutes	46,800.00	33,800.00
Bureau of Industries	3,000.00	
Dairy Branch	148,819.95	145,800.00
Fruit Branch	75,650.00	64,500.00
Ontario Veterinary College	32,450.00	31,650.00
Miscellaneous	242,550.00	192,150.00
Agricultural College:		
Salaries and Expenses	205,092.01	192,641.00
Macdonald Institute and Hall	49,190.00	45,990.00
Forestry	1,000.00	1,000.00
Animal Husbandry, Farm and Experimental Feeding Department	29,150.00	26,550.00
Field Experiments	22,905.00	20,705.00
Experimental Dairy Department	11,056.00	11,056.00
Dairy School	8,165.00	8,165.00
Poultry Department	20,003.00	15,193.00
Horticultural Department	17,748.00	15,548.00
Apicultural Department	1,750.00	1,750.00
Soil Physics Department	4,000.00	4,000.00
Mechanical Department	1,350.00	1,350.00
Totals	$1,248,030.96	$1,120,648.00

MANITOBA

AT the session of the Manitoba legislature for 1918, seven bills relating to agriculture were passed. These included an Act to establish a Government employment bureau, the annual Municipal Seed Grain Act, and Acts amending the Dairy Act, 1915, the Horse Breeders' Act, the Sheep Protection Act, the Settlers' Animal Purchase Act, and the Noxious Weeds Act.

DISTRIBUTION OF LABOUR

The Act establishing a Government employment bureau attaches the bureau to the provincial Department of Agriculture, and defines its object to be the distribution of labour throughout the province. An advisory board may be created, consisting of one representative of the Trades and Labour Council, the organized farmers, the employers of non-agricultural labour, and the secretary of the provincial Bureau of Labour. Branch bureaux can be established wherever thought necessary. Section 9 of the Act prohibits any person, corporation or association from receiving payment for supplying labour or information regarding employers wanting workers, or workers wanting employment. In case of a strike, no bureau can send labour without informing the person of the existence of the strike. Contravention of any provision of the Act brings liability to a fine of not less than $10 or more than $25.

ANNUAL SEED GRAIN ACT

The Municipal Seed Grain Act gives municipalities, within six months of its passing, power to raise a loan not exceeding $60,000 for the purpose of furnishing seed grain to farmers, or to relatives of soldiers, or to the soldiers themselves. Returns have to be made to the provincial Minister of Agriculture of the manner in which the money is used. Limitation of the value of the seed grain advanced to any one person was originally set at $600, but, by an amendment passed at the same session, the limitation of the value was increased to $1,200. In the case of soldiers on service, notes signed on behalf of the absent owner can be accepted as made by him.

HORSE BREEDERS' ACT

The Act amending the Horse Breeders' Act provides that it shall be the duty of veterinary inspectors to prosecute any breaches or violations of the Act, and that, until a foal reaches the age of one year, the owner of the sire of such foal shall, without registration, have a lien for the unpaid service fees of the mare; also that the stallion owner may seize and sell the foal for the service fees, or any part thereof, remaining unpaid, the sale to take place at auction on ten days' notice. The lien is to be deemed as having arisen at the time of service and takes precedence of all other claims on the foal.

SHEEP PROTECTION ACT

The Sheep Protection amendment Act provides that, if the owner of a dog killing or injuring sheep is unknown, the owner of the sheep can recover two-thirds of the value of the sheep from the municipality on satisfying the court that he has used due diligence to ascertain the owner of the dog. Any action under the Act must be taken within three months after the killing or injury has occurred.

The Settlers' Animal Purchase Amendment Act provides that, with the consent of the Minister of Agriculture for the province, the number of settlers in any community or organizations can be increased.

DAIRY ACT AMENDMENT

The bill amending the Dairy Act

of 1915 provides that instead of a vote for every share, a shareholder shall have one vote only, and that there shall be no voting by proxy. Paragraph (*a*) of section 50 of the Act is changed to require on the first quality of butter the name and address of the creamery and "the number of the churning" instead of, as formerly, after the address the words "Manitoba creamery butter." Section 75 is amended by adding "That no person shall accept cream from any receiving station that has not complied with the other provisions of the section." To section 75 *b*, sub-section (i) is added, making the fee for registration five dollars, which must be paid with the application for registration. Operators in a dairy are required to take out a license for which a fee of one dollar is charged.

NOXIOUS WEEDS ACT AMENDMENT

By the amending Act to the Noxious Weeds Act, "and annual" is added after "perennial" in reference to sow thistle, and "toad flax" added to Class I of the named weeds in paragraph (*b*) of section 2.

Subdivision 2 of section 15 is amended to provide that the owner or agent of unoccupied land may appoint a resident agent for the purpose of notification.

Section 21 of the Act is added to by a new section providing that costs incurred in enforcing the Act in individual cases shall be placed upon the collector's roll to be collected the same as taxes.

Section 30 is amended so that the fine for a first offence against the provision ordering the destruction of noxious weeds shall be fifteen dollars, and not more than fifty, instead of exactly fifteen dollars, as formerly.

APPROPRIATIONS FOR AGRICULTURE

The appropriations for agriculture and immigration for the year ending November 30, 1918, are:

Salaries	$13,316.66
Supplies and Expenses	1,500.00
Agriculture and Statistics	122,495.00
Manitoba Agricultural College	205,135.00
Immigration and Colonization	45,000.00
Agricultural Publications	20,100.00
Miscellaneous and Unforeseen	2,000.00
Birtle Demonstration Farm	2,560.00
Settlers' Animal Purchase Act	6,800.00
Total	$418,906.66

Saskatoon, Sask., feeds 500 to 800 hogs on garbage, mixed with a small amount of grain. The City of Worcester, Mass., feeds 3,000 hogs on garbage. Springfield, Mass., sells $50,000 worth of municipal fed hogs. Grand Rapids, Mich., feeds 300 cattle, 400 sheep and 700 pigs on garbage and a certain amount of hay. Arlington, Mass., Lowell, Mass., Fall River, Mass., and Providence, R.I., all distribute their garbage to private companies who feed it to live stock.—Canada Food Board Note.

WAR-TIME HOG RATIONS

NOVA SCOTIA

BY JOHN M. TRUEMAN, PROFESSOR OF AGRICULTURE, AGRICULTURAL COLLEGE, TRURO

DURING the past three years the Nova Scotia Agricultural College has fed a few pigs with grain, skim milk, and mangels. The results of these feeding tests have shown that gains can be made with a comparatively small amount of grain. They also show that when skim milk and mangels are fed, gains can be made with less total digestible nutrients than when grain is fed alone. Many experiments have proven that gains cannot be put on pigs for less than 400 lb. of grain per 100 lb. of gain, and in most cases still more is required. In the tables given below, it is shown that gains were made for an average of 148 lb of grain, 900 lb. of skim milk, and 110 lb. of mangels. Allowing 75% of total digestible nutrients in the grain, 9% in skimmed milk, and 7.5% in mangels, the total in the above feed would amount to 201 lb of digestible nutrients. If, on the other hand, 400 lb. of grain had been fed, it would have contained at least 300 lb. of digestible nutrients. Here, therefore, is not only a saving of high-priced grains by feeding skim milk and mangels, but also an actual saving in the amount of digestible nutrients required to produce 100 lb. of pork. Table No. 1 shows the average daily ration of the pigs for 18 weeks. The amouut of feed given was quite small when the pigs were only 6 weeks old, but, as they approached the age of 24 weeks, they consumed as much as 4 lb. of grain, 15 lb. of skim milk, and 4 lb. of mangels per day. This was when they had reached a live weight of 200 lb. or over.

TABLE NO. 1—AVERAGE DAILY RATIONS FROM 6 WEEKS OLD TO 24 WEEKS OLD

	Lb. of grain.	Lb. of skim milk	Lb. of mangels	Equivalent to grain	Cost in cents
Cross-bred, York—Berk 1915	2.60	14.0	1.4	5.5	8.4
Pure Yorkshire, 1916	2.24	12.6	2.0	5.0	9.0
Pure Berkshire, 1916	2.02	12.6	1.3	4.7	8.4
Pure Yorkshire, 1917	2.37	14.1	1.9	5.4	12.3
Pure Berkshire, 1917	1.85	11.0	1.38	4.2	9.5

TABLE NO. 2—FEED EATEN TO PRODUCE 100 LB. OF GAIN.

	Lb. of grain	Lb. of skim milk	Lb. of mangels	Equivalent to grain	Cost
Cross bred, York—Berk 1915	157	850	84.0	338	$5.11
Pure Yorkshire, 1916	143	812	121.3	321	5.71
Pure Berkshire, 1916	145	910	94.8	339	6.10
Pure Yorkshire, 1917	142	908	137.0	351	7.98
Pure Berkshire, 1917	150	928	112.0	350	7.91

In the above tables 500 lb. of skim milk and 750 lb. of mangels are allowed to equal 100 lb. of grain. Prices allowed were as follows: In 1915, grain $1.50 per cwt., skim milk 30c. per cwt., and mangels 15c. per bushel; in 1916, $1.80 for grain, 35c for skim milk, and 17c. for mangels; and in 1917, $2.50 for grain, 40c. for skim milk, and 20c. for mangels.

ONTARIO

BY H. M. KING, B.S.A., LECTURER IN ANIMAL HUSBANDRY, AGRICULTURAL COLLEGE

DESPITE the fact that prices for pork product are ruling fairly high, the question of growing, and particularly of finishing, swine is a difficult one to solve under present conditions. Certain feeds which we have become accustomed to use being practically off the market, it is necessary that, during this season at least, the method of operation be somewhat altered. The greater and more judicious use of pasture crops appears to be one of the chief points in the solution of the problem. Experimental work at the Ontario Agricultural College has demonstrated that hogs generally make the best use of pasture when they have attained a weight of one hundred pounds or more, but feed conditions and market demands have a bearing on this point. During the present season, then, it appears as if we will have to rely considerably on pasture particularly for growing pigs, and thereby, partially, at least, save the concentrates for finishing. The use of a good annual pasture mixture is to be commended.

Skim milk and whey are year by year becoming less available in certain districts where large numbers of hogs were formerly produced. To take their place, tankage is undoubtedly the best available feed. Even though costing considerable per ton, it can be fed profitably under present conditions. Skim milk has its greatest value when fed to young pigs, and particularly during the first month or two after weaning a combination of skim milk and tankage has given quick gains in our experimental work. Sour skim milk and sour whey have given practically as good results as sweet milk and whey for very young pigs. Care should be taken not to feed sweet and sour milk or whey intermittently. Possibly the best showing of skim milk in our experimental work has been where the proportion of milk to meal was about 2.5 to 1. In one trial in which this proportion was used, it was shown that 365.6 pounds of skim milk proved equal to 100 pounds of meal, but in later years the returns from skim milk have not been so marked; about 3 to 1 is a good ratio between the skim milk and meal. Mill screenings are being fed experimentally during the present season, and apparently with success. At the present time it appears as if the gains will be more cheaply produced than if cereal grains were used altogether. The heaviest feeding of screenings used is one-half the meal ration.

If, by a more general and judicious use of the various pasture crops, it will be possible to grow the spring litters of pigs to considerable weight the question of providing concentrates to finish them is one that is difficult to solve. If seed can be secured, we are planning to experiment in the growing of a few acres of early maturing corn which may be harvested in different ways, and, possibly, if the labour situation does not change, it will be, partially, at least, harvested by the hogs themselves. Whether or not what we propose can be done economically remains to be seen.

ALBERTA

BY JAS. McCAIG, EDITOR OF PUBLICATIONS, DEPARTMENT OF AGRICULTURE, EDMONTON

OUR hog enterprises on the demonstration farms are concerned with raising pure-bred stock for distribution to farmers, rather than the raising of hogs for pork production.

We have not used concentrated substitutes to take the place of cereal grains in the feeding of hogs. Our growing pigs consist of young spring litters. The pastures that we use are mixtures of oats and wheat, oats and barley, and, later, rape. When the pigs are weaned they are fed shorts at first, followed by sifted oat chop, and after that time, when they reach 160 to 180 lb., they are fed barley and oat chop along with the pastures.

We have very few fattening hogs; the number being limited to a few male pigs that are not good enough for breeding purposes. They are fed in the same way as the growing pigs, with an increase in the grain ration toward the finishing period. We feed twice a day.

SHORT COURSES IN AGRICULTURE

ONTARIO

FOR WOMEN

THE Ontario Agricultural College will hold a short course in practical work for young women at the college during the three weeks commencing the 1st of May. The course of instruction will be made as practical as possible. Most of the time will be spent at work in the gardens, orchards, stables, farm dairy, and poultry yard, giving actual practice in the operations which women are likely to be called upon to perform on the farm. The practical work will be supplemented by lectures when necessary. The course is given without fee, but the students will be charged fifteen dollars for board and room. Students will be required to be over eighteen years of age, in good sound health and physically capable of undertaking light farm work. A condition of entry upon the course is that students shall remain three weeks, and agree to spend at least four months upon a farm during the year.

AT NEW LISKEARD

AGRICULTURAL instruction activities at the New Liskeard agricultural school were commenced with a three-days' short course and seed fair during the first week of April. A two-story pavilion has been completed for the judging of live stock and the holding of seed fairs and lectures. At the seed fair there were 120 entries of grain, grass seeds and potatoes exhibited by fifty farmers. Dr. C. A. Zavitz, who judged the seed, was favourably impressed with the adaptibility of the district for growing Marquis wheat, Canadian Beauty and Golden Vine peas, O.A.C. No. 3 oats, O.A.C. No. 21 barley, and alfalfa seed. Some excellent potatoes were grown, but there were too many varieties. The short course and fair, financed largely in every province out of AGRICULTURAL INSTRUCTION ACT funds, were organized by Mr. W. G. Nixon, Superintendent of Government Farms at New Liskeard, Monteith, and Kapuskasing.

SASKATCHEWAN

BY S. E. GREENWAY, DIRECTOR EXTENSION DEPARTMENT

LECTURERS at the short courses in Saskatchewan this year report the most enthusiastic meetings yet held in the province. Of the sixty odd courses held, not more than three or four were found wanting in the matter of interest. Exact figures of attendance are not yet available, and it is not expected that any records will have been made, but nevertheless considerable satisfaction has been expressed, both by the lecturers and the public.

We were able this year to give the farmers and their wives considerable poultry work and farm accounting, in addition to the usual field and animal husbandry work. The demand for greater production and conservation developed more or less tenchical work regarding rationing, both for man and beast, which was received with surprising avidity. This is especially true in its relationship to the feeding of farm stock, since feeds are so scarce and so costly, and the need of pork products so great. This situation has been largely responsible for the interest in simple farm accounts, as the farmers desire to know, with some degree of definiteness, just whether their operations in the production of pork are going to net them a profit or not. It is satisfactory to note that they are going to do their part in the production of bacon and fat, though the profit may not be large.

It might be added in this connection that the food conservation and pork production propaganda has been carried on at all the seed fairs held this winter, of which there has been over sixty. The method of conducting the seed fairs for a number of years has been to give them very practical short course features. Often poultry shows are held, and, as the activity usually extends over two or more days, much time is given up to discussions, demonstrations, and judging competitions in cereals, animals, and poultry. Also, at the short courses the schools are visited and several hours of work put on with the pupils. This feature of our extension work has been responsible for the greatly increased interest in scientific agriculture in the province, both in the schools and among the farm people.

In addition to the foregoing, regular work for boys' and girls' clubs was put on by special speakers. This movement is receiving a great impetus this year.

THE DISTRIBUTION OF BABY CHICKS

QUEBEC

BY BROTHER WILFRID, POULTRY SUPERINTENDENT, OKA AGRICULTURAL INSTITUTE

I AM asked by Reverend Brother Liguori to give you the results of our experiment on the distributton of one-day chicks. I do so with the greatest pleasure, all the more so because when I made my first experiment in this line in 1913, people generally disbelieved the idea that it could be successful. It was a new thing in our province, it is true, but it was done elsewhere; why could it not be practised here also?

In 1913 some 200 chicks were shipped, and all of these got to destination safe and sound. Since then the demand has increased, and last year over 2,000 were distributed, giving entire satisfaction to the purchasers.

During these four years only one

accident happened, and that was because of a two days' detention in a railroad station. The chicks, which should have been delivered on Saturday evening, were delivered only on Monday. This was too much for them, and they died. Last year, in shipment of fifty, only two chicks were found dead, probably on account of overcrowding in a shipping basket. These are the only accidents that have been recorded in four years.

We are expecting an increase in the demand this year. As the purchaser knows now what to expect, he is ready to receive the chicks when they arrive, and he knows there is more advantage in purchasing chicks than eggs for incubation that often have to suffer from mishandling during transportation.

The baskets which I use for shipping are fruit baskets, of a size proportionate to the number of chicks shipped. The inside of the basket is lined with sack-cloth, and a filling of chaff is put between this cloth and the facing of the basket. When the chicks are in the basket, I put a layer of good felt right between the back of the chicks and the cover of the basket. When the temperature is somewhat cold, I put paper, newspapers, etc., between this layer of felt and the cover of the basket. That is all.

The special baskets are more expensive than those which I use.

I have shipped chicks everywhere in the province, and even as far as North Bay, Ontario, always with complete success.

Last year I had to make special hatchings to satisfy late requests.

Chicks must not, on any occasion, be older than one day, especially when they are shipped over long distances.

They should be placed in a good warm brooder, or under a hen, as soon as they arrive.

As soon as they arrive, they should be given sour milk; this should be their first meal. They should be fed sparingly during the first few days.

I have not received any complaint regarding the distribution of chicks.

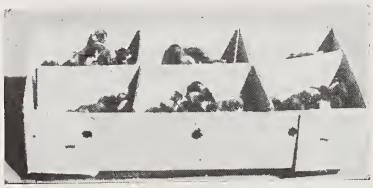
MANITOBA

BY M. C. HERNER, PROFESSOR OF POULTRY HUSBANDRY, AGRICULTURAL COLLEGE

THE chief question in the day old chick business is, can it be made profitable? In the South, and in sections of the East, this is one of the best paying branches of the poultry industry. Day-old chicks can be produced, shipped, and laid down at northern points at 25 per cent less than they can be hatched here, and still leave a good margin of profit for the plant engaged in the business. Climatic conditions are so favourable in those sections that good hatches can be obtained early in the spring and the chicks shipped north before the hatching season properly started there.

In this western country the greatest difficulty is to get the high fertility and hatching power that a plant should have early in the season to make the business profitable. The price of day-old chicks, apart from quality, depends altogether on these two factors. If eggs for hatching are worth 8 cents each when they go in the incubator, and it takes two and a half eggs to make one chick, the initial cost of these day-old chicks is from 20 to 25 cents each, without figuring on the labour, oil, and so on. In some breeds like Wyandottes, Reds, and Orpingtons it is next to impossible to get even as good results as these, and the price per chick would, therefore, have to be correspondingly higher. With Leghorns there is likely to be a reasonable profit on these prices, and with Barred Rocks the plant would break about even. As the season advances better results can be obtained, as the

fertility increases and the hatching power improves. Averaging up conditions as they are in the West from year to year, a safe estimate in hatching work would be one chick for every two eggs set. This refers to incubation work on a large scale. On this basis it is obvious that in making a specialty of the baby chick business, higher prices must be charged than where more favourable conditions prevail. No poultry plant in the West can afford to sell day-old chicks for less than 25 cents each, and make it a paying business, and at this rate breeding stock of only ordinary quality can be used.



A HUNDRED BABY CHICKS PACKED READY FOR SHIPPING; COVER OF BOXES TO GO ON

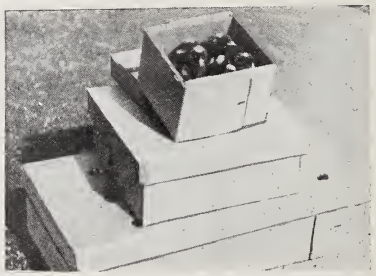
WORK OF THE DEPARTMENT

This Department has made a practice during the last three seasons of selling day-old or baby chicks. The work has been confined almost entirely to White Leghorns. Only a limited number of Barred Rocks have been distributed. The first season the work was undertaken only White Leghorns were sold, and the price was 20 cents each right out of the incubator. No chicks were delivered before May 15th. One lot of 50 were taken out of the incubator the day they were hatched and shipped a distance of 1,400 miles with only one dead when they reached their destination.

The first season upwards of 1,500 were sent out, and not a single case of poor success in brooding and rearing was reported. The second season only 1,000 were sent out. During the past season we sent out upwards of 2,000 baby chicks varying in age from day-old chicks to 3 and 4 weeks of age. Practically all that were over a day old were taken by purchasers coming on the plant, and taking them away. We disposed of a large number of baby chicks one, two, three and four weeks of age at 20, 30, 35, and 40 cents each respectively. A large number of these went to back-yard poultry raisers in the city. Chicks can be shipped more satisfactorily a day old than at an older age. The chance of loss is lower.

PACKING AND SHIPPING

The method of packing is quite simple, strong card board boxes are



BABY CHICKS READY TO SHIP; THREE SIZES OF BOXES, 12, 50, AND 100

used. They come in sizes to hold a dozen, 25, 50, or 100 chicks respectively. Those holding 25 or more are divided into compartments by card board partitions. There are small air holes punched in the side of the box to furnish sufficient ventilation. The sooner they are shipped after hatched and properly dried the less risk. No feed or water need be given en route. A small quantity of bran in the bottom of the box will prevent spreading the legs of the chicks, and crippling them in this way. Care must be taken not to put in too much, or they might be smothered when the box is tilted a little. The express companies generally rush baby chicks through as quickly as possible, and take every reasonable precaution in handling them. Just recently the United States has admitted baby

chicks to parcel post. This is certainly a good thing for the poultrymen, and is likely to work out to the further development of the baby chick business.

A BIG DEMAND

This season there is an enormous demand for baby chicks, both from the farmers and from the back-yard poultry-keepers. Most of them want to do away with the work of hatching their own, and are willing to pay a good price for them. The prospects are for a good trade in them, both from the buyer and seller's view point. The fertility and hatching power is high this year, and the egg production so far this spring has been high too. It would appear that this branch of the business should yield a fairly good profit this year.

The incubators must be used to do a baby chick business. There is always the danger of having shipments go out that were hatched under abnormal conditions, or conditions which affect the vigour and vitality to such an extent that the purchaser has poor success in rearing them. Often a purchaser has good success with one shipment, and in the next lot many of them may die off. If, however, the principles of artificial incubation are properly followed, and the eggs used are from strong, vigorous, and healthy breeding stock, there is no reason why good results should not be attained in rearing the baby chicks. Over crowding and over heating en route may sometimes happen, in which case the mortality in rearing would likely be quite high.

UNCERTAINTY OF HATCHING

Poultrymen can never give a straight out and out answer as to the probable extent of the baby chick business because there are so many factors entering which affect the hatching, shipping, brooding and rearing. The poultry plant can never be absolutely sure of a certain number of chicks from a given lot of eggs, nor can we give a definite estimate as to the number that will live. Notwithstanding these facts, we consider that the baby chick business has great possibilities. As the methods and systems of artificial incubation on a large scale are being better understood, improved, and perfected one drawback after another is likely to be removed. It is a new business, and as such is not different to any other business. It requires time to place it on a permanent footing.

ALBERTA

BY A. W. FOLEY, POULTRY SUPERINTENDENT

WE have been developing the poultry work in this province for a number of years by the distribution of baby chicks. I believe this to be a better method than the sending out of eggs. In the case of eggs there is often delay by not having hens ready at the proper time, and there is always a possibility of breakage making more or less chance work in the results.

With baby chicks our experience is that the chicks arrive in good condition no matter what portion of the province we ship to. Occasionally they are 48 hours on the road. The chicks get better handling and attention from the express companies, and we seldom if ever receive a complaint regarding their arrival. In this case the purchaser takes no chances, as he gets what he orders in good condition. As a matter of fact, we are so much in favour of the system that we are each year enlarging on our work, and now have an incubator of 3,600-egg capacity in use at the plant.

We ship in 25 chick lots in the regular baby chick shipping cases that we purchase from supply houses for this purpose. The boxes have about an inch of soft straw or hay in the bottom, and the chicks are placed in the boxes as soon as they are nicely dry after the hatch is over. For ventilation in transit a number of holes are punched in the sides and top of the box with a lead pencil.

NOVA SCOTIA

AGRICULTURAL INSTRUCTION ACTIVITIES

BY J. G. ARCHIBALD, B.S.A., DEPARTMENT OF CHEMISTRY

THE principal activities of the Department have for some time past been centred around its propaganda for increased production. The meetings held throughout the province have been unusually well attended. Five short courses have been held, the average attendance being 150. Some of the leading features of the propaganda have been:

(1) The policy of offering to pay farmers' associations and dealers for loss resulting from non-sale for seeding purposes, of any grain or other seed imported for that purpose. This has resulted in bringing in a very substantial supply of good seed—probably ample for the country's needs this year.

(2) Government purchase of available supplies of fertilizer. Very fortunately a shortage of fertilizer was foreseen last fall, and the Department has secured one hundred carloads, none of which was sold till the trade supply disappeared. The cars are now being rapidly placed, and this source of supply should prove of material aid in increasing production.

(3) The securing and location of considerable quantities of hardy strains of seed beans is now having its effect. These are being bought by farmers and townspeople in the northern and eastern parts of the province, who, heretofore, did not grow beans at all. They are high grade seed, purchased in small localities from men who have made a specialty of bean growing under comparatively severe weather conditions. Varieties have thus been secured which mature from ten days to three weeks earlier than the ordinary kinds.

(4) Fourteen Fordson tractors have to date been ordered for the province. These are to be re-distributed from Truro. In this connection it is interesting to note that the Agricultural College is fortunate enough to possess the first one of these machines ever turned out, it having been donated by Mr. Ford himself in the fall of 1917.

(5) The Department has made a special feature of a 25% bonus on the cost to farmers purchasing two-furrow ploughs. As a result 200 extra ploughs of this type have been sold in the province. As every purchaser gives his guarantee that the plough will be used to the utmost of his endeavour, this means a very considerable increase in the acreage under cultivation.

(6) Arrangements are being made for the establishment of a farm credit scheme through the banks. Details of the plan are not yet complete, but will be announced in the course of a few days.

FOOD PRODUCTION WEEK

The Lieutenant-Governor proclaimed the week beginning April 7th, as a week of dedication to the food production campaign. He wrote a personal letter to every clergyman in the province setting forth the facts, and urging the importance of a maximum effort on the part of all. The "Soldiers of the Soil" were mustered throughout the province during that week. As this movement has been well and thoroughly organized by the Canada Food Board, it should be the means of furnishing the farmers with much useful and sadly needed labour.

The Agricultural College closed on April 11th. Sixty-two students have been enrolled this session, about half the number that attended before the war. The closing address was given by Dr. J. W. Robertson.

A DAIRY PRODUCTS COURSE

The Inter-provincial Dairy School for the Maritime Provinces has just finished its sessions at the college. A very successful course is reported with a total attendance of 55. Of these 35 took the creamerymen's course, 18 the course for cheese-makers, and 9 the course on milk testing and cream separators. It will be noticed that this makes a total of 62, instead of 55. This is due to the fact that some took more than one course. Probably the most outstanding feature of the work was the presence of Mr. Geo. H. Barr, Chief of the Dairy Division at Ottawa, who conducted in person the instruction in cheese-making.

QUEBEC

DEGREE IN HOUSEHOLD SCIENCE

BY F. C. HARRISON, D.Sc., PRINCIPAL, MACDONALD COLLEGE

THE work for the new degree in household science will consist of two years in the faculty of Arts of McGill University and two years at Macdonald College. Good residential accommodation is afforded for women at the Royal Victoria College, Montreal, and in the women's residence at Macdonald College.

First year work will be that of the first year of the B.A., with French recommended as an alternative language provided matriculation has been reached by those taking French; or, the first year may be that of the first year course for B.Sc.

Second year work will be that of the second year of B.A., with English and Latin together with botany, chemistry, zoology, and English literature or French, and any one of the following subjects at the choice of the student: economics, history, philosophy; or, the second year work may be that prescribed for the B.Sc., which includes English, biology and chemistry, and a choice of one of the following: geology, mathematics, physics, economics and political science, English history and philosophy.

The work of the third and fourth years at Macdonald College will consist of English and economics, the same as that given to the third and fourth year students in the faculty of agriculture; science subjects, such as chemistry, physics, biology, and bacteriology, partly taken in the school of agriculture and partly in the school of household science, and the technical subjects—foods, textiles, clothing, the home and the institution—will be given entirely by the school of household science.

This course represents two-fourths academic work, one-fourth scientific, and one-fourth technical, a proportion very similar to that given for the B.A. in Household Science at Toronto University, and somewhat similar to that given in a large number of American institutions, for example Chicago, Columbia, Wisconsin, and Cornell universities, where similar course have been in operation for over ten years.

The title of the degree will be Bachelor of Household Science, and the abbreviation B.H.S.

MAPLE PRODUCTS EXHIBITION

THE prize list of the exhibition of Maple Products at the Provincial Exhibition Park, June 25, 26, 27 and 28, provides for eight classes as follows:—

1. For the best maple sugar, not less than 10 lb. in one pound cakes, made by the exhibitor—$12, $10, $9, $8, $7, $6, $5, $4, $3, and 15 prizes of $2 each.

2. For the best soft sugar in tins, not less than 10 lb., made by the exhibitor. (This sugar must be made with the sap gathered in the last days of the season.) —$10, $9, $8, $7, $6, $5, $4, $3, and 10 prizes of $2 each.

3. For the best bottled maple syrup, not less than one gallon, made by the exhibitor—$15, $12, $10, $9, $8, $7, $6, $5, $4, and 15 prizes of $3 each.

4. For the best artistic display of maple sugar and syrup made by the producer of same. Not less than 10 gals. of syrup and 50 lb. of sugar, in cakes, in tins, etc.— $12, $10, $8, $6, $4.

5. For the best artistic display of maple sugar and syrup made by a dealer or trader, 20 gallons of syrup and 100 lb. of sugar, in cakes, tins, etc.—$25, $20, $15, $10 $5.

6. For the best way of preparing and offering on the retail market maple sugar in the easiest marketable way, so as to increase the selling of same, particularly to the desirous public at large. The exhibitor will exhibit a global quantity of 2 gallons of syrup and 15 lb. of sugar—$20, $15, $10, $8, $6, $4, $3.

7. For the best products made with maple sugar and syrup, such as candies, chocolates, butter, confectionery of any kind, in the easiest marketable way, etc., made by any person in the Dominion. Not less than 3 lb. for each exhibited variety —$15, $12, $10, $8, $6, $4, $3.

8. For the best illustrated trade mark or advertisement of the most original and best adapted for the selling of maple products. Any person in the Dominion may compete. The exhibitor will make a solemn declaration of the work being his own—$15, $12, $10, $8, $6, $5, $4, $3.

The federal Government has made a special grant, through the Dominion Minister of Agriculture, in aid of the funds called for by this prize list. A number of special prizes are also being given. Entries are required to be made on or before June 12 and exhibits must be in place by ten o'clock Tuesday morning, June 25th. No entry fee is required. At the closing of the exhibition, the Provincial Exhibition Commission will sell the exhibited products at wholesale market prices, deducting 10% to cover expenses. Exhibitors winning prizes will be asked to give particulars concerning their methods of making maple products and the condition of their bushes. These answers will be gathered and published. In all 125 prizes are to be offered.

A SURVEY OF SUGAR GROVES

BY G. C. PICHE, CHIEF OF THE FORESTRY BRANCH

A survey of maple sugar groves in various parts of the province was begun last fall by the Forestry Branch. The object of this survey is to gather accurate data on the following:

1. The proportion of the various species of trees in each grove, to determine the influence, if any, of a mixture of trees on the yield of the sap, etc., etc.
2. The influence of the soil.
3. The influence of the topography of the ground.
4. The temperature.

Notes are also made on the equipment available, the methods of tapping the trees, of gathering the sap, and also on the yield of sap, by species of maples, by a number of trees, and as influenced by the frost.

Information is also being gathered on the methods of making syrup and sugar, and, finally, a statement showing the profits or losses of the industry will be made up.

All reports will be compiled at the Forestry Branch by counties and by districts; thus before long complete and careful statistics concerning this

valuable industry will be available.

Sugar now sells at a high price. It is, therefore, in the interest of our farmers to work their sugar groves so as to secure their own supply of sugar and syrup.

All the owners of sugar groves desiring to help in the survey are invited to write to the chief of the Forestry Branch, Quebec, who will be glad to receive any information that can be given.

ONTARIO

FARM MANAGEMENT SURVEYS

A REPORT has been issued of the first farm management survey carried out by the Ontario Agricultural College under the direction of Professor Andrew Leitch, B.S.A. The survey was made in the township of Caledon, Peel County, on 113 farms. The work was done during October and November last year, and embodied the farm year October 1, 1916, to October 1, 1917. The purpose of this survey was to permit of a study of those factors, which have the greatest influence towards raising or lowering the net income of the average farm.

Owing to some of the farmers not having threshed, only 82 of the original 113 records were completed. The following table shows results of the survey:—

INFLUENCE OF SIZE OF FARM ON *LABOUR INCOME

TABLE I.

Acres	Under 85	86–100	101–150	151–241
No. Farms	25	16	22	19
Size—Average Acres	72.3	93.2	129.6	175.3
Capital—Average	$6944	$8942	$12635	$16111
Capital in Buildings—Average	2192	2678	3693	4472
Capital in Machinery—Average	422	510	598	789
Productive Capital—Average	4330	5754	8344	10850
Percentage of Capital in Buildings and Machinery Average	37.7	35.7	34.0	32.7
Crop Acres per Horse—Average	18.8	21.1	20.6	22.5
Crop Acres per Man—Average	46.9	58.0	60.5	63.4
*Labour Income—Average	$507	$891	$1091	$1581

	Average of all farms.
Receipts per Live Stock Unit	$74.70
Feed per Live Stock Unit	56.80
Profit per Live Stock Unit (over cost of feed)	17.90
Crop Yields	100%

Table 1 shows one very striking result—that the amount of labour income increases directly with the acreage of the farm, or, otherwise, increases directly with the size of the farm business. All the farms were engaged in practically the same type of farming. As will be seen, the average labour income for the group of farms under 85 acres in extent was $507, whereas that for the group over 150 acres in extent was $1,581, those of the other two groups ranging proportionately between.

*The term "Labour Income" represents the net receipts after paying all expenses on the farm, including 5% interest on the capital invested, and paying for all labour save that of the man who actually operated the farm.

INFLUENCE OF GOOD CROPS AND GOOD STOCK

TABLE II.

	Live Stock Below Average	Live Stock Above Average
Crops Below Average	No. Farms ..... 26 Average size ..... 108 Labour Income ..... $508 Labour Income per acre $4.70	No. Farms ..... 21 Average size ..... 112 Labour Income ..... $1047 Labour Income per acre $9.35
Crops Above Average...	No. Farms ..... 14 Average size ..... 127 Labour Income ..... $977 Labour Income per acre $7.70	No. Farms ..... 21 Average size ..... 120 Labour Income ..... $1530 Labour Income per acre ... $12.75

Table 2 shows the relative influence of crop and live stock production on the labour income. Owing to the difference in the average size of the farm in the various groups, the "Labour Income per Acre" has also been calculated. It will be seen on comparing both groups with live stock below the average, that an increase in efficiency of crop production means an increase of labour income of $469—or an increase of $3.00 per acre. Likewise in the groups with live stock above the average, an increase in crop production increases the labour income by $483—or $3.40 per acre. But on comparing the two groups with crops below the average it will be seen that an increase in returns from live stock adds $539 to the labour income—at the rate of $4.65 per acre. And comparing the two groups with crops above the average, we find that an increase in stock returns means an addition of $553 to the labour income—or $5.05 per acre. Otherwise, if we make a comparison of the group with both crops and stock below the average with the group underneath, and the crop to the right, we see that, with stock the same and crops increased, the raise in labour income is $469—or $3.00 per acre—whereas with crops the same and stock returns increased, the raise in labour income is $539—or $4.65 per acre. Thus the conclusion is necessarily reached that in the area surveyed, the greatest opportunity for raising the labour income lies in increasing the quality of the live stock.

TO WHAT EXTENT DOES GOOD FEEDING PAY?

TABLE III.

Feed fed, per *L. S. U.	Under $43	$43–50	$50–60	$60–70	Over $70
Average cost per L. S. U.	$36.46	$45.90	$54.21	$63.74	$82.62
Receipts per L. S. U.	67.91	70.56	78.74	77.09	78.41
No. Farms	16	14	19	16	17
Average size, acres	108	129	129	116	96
Labour Income	$991	$1241	$1104	$907	$722
Labour Income per acre	$9.2	$ 9.6	$ 8.6	$7.8	$7.5

This table adds further proof to the well-known law that after a certain degree of production has been reached, a higher degree cannot be attained without lowering the net profits. The cost of the final returns is more than the sale price. The amount of feed which may be fed profitably will, of course, depend upon the quality of the stock. With the average of Caledon township stock, approximately fifty dollars worth of feed may be fed profitably. It will be seen that the receipts per live stock unit in the last three groups

*The "Live Stock Unit" is represented in one mature cow or horse, or a proportionate number of smaller animals maintained for one year, as for example, 2 head young cattle, 7 sheep, 100 hens, hogs according to weight.

are practically the same. The increase in feed did not increase the returns. Hence, the profit was lowered with the direct effect of lowering the labour income. In the group which was fed most heavily, each live stock unit yielded a loss of $4.21 on feed alone. The labour expended on this stock was also lost. As the average size of farm varies somewhat in the different groups, here also the "Labour Income per Acre" has been calculated. It is the highest in the second group, where the average feed consumed amounted to $45.90 per live stock unit.

SUMMARY

Briefly, then, the findings of the survey thus far may be summed up as:—

1. The size of the business on the small farm engaged in general mixed farming is too small to pay all expenses and leave more than a very small labour income for the operator.

2. High profits from live stock have a greater influence on the labour income than have high crop yields.

3. The quality of the live stock determines the amount of feed which may be fed profitably. Heavy feeding to stock of low quality means a loss rather than a gain. In order that the crops grown may be fed upon the farm to keep up the soil fertility, and at the same time yield a profit, the quality of the stock on a great many farms must be increased.

A SURVEY IN OXFORD COUNTY

A second farm management demonstration survey has been carried out under Professor Leitch. The work has been done in the county of Oxford, where farms have been selected to represent average dairy farm conditions in Western Ontario. Parts of seven townships were covered, including 430 farms, which is about one-fifth of the farms in the territory covered. The staff of this survey was employed during two months, covering the period from February 19th to April 19th. A similar survey will soon be commenced in the county of Dundas, where conditions representing average dairy farming in Eastern Ontario will be exemplified. It is the purpose of the Ontario Agricultural College to repeat these surveys annually in these districts for five years, and to deal with other districts and other conditions of farming. The Caledon township survey was carried on with funds provided under THE AGRICULTURAL INSTRUCTION ACT. The later surveys are being financed with provincial funds apart from the salary of Professor Leitch, which will continue to be drawn from THE AGRICULTURAL INSTRUCTION ACT appropriations for the province of Ontario.

THE DEPARTMENT'S TRACTOR SERVICE

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER OF AGRICULTURE

THE Ontario Department of Agriculture in its campaign for greater production met the labour difficulty in some measure last year by securing 127 tractors, which were placed at the disposal of the farmers throughout the province to assist in ploughing and harrowing. In adopting this policy the Government also desired to demonstrate the usefulness of tractors on the average Ontario farm. In accordance with this idea, 11 different makes of 16 different types were purchased, so that farmers might have an opportunity of comparing the different machines under field conditions. Each machine was equipped with a

3-furrow plough, and in some cases with disc harrows. Owing to the difficulty and expense of transporting the machines, the Department required sufficient contracts to be secured with farmers within a comparatively small area, generally a township, in order to insure the continuous use of the machine for the greater part of the season. With a view of assisting as many farmers as possible, from 15 to 20 acres were ploughed for each farmer, except in cases where there was no immediate demand for the tractor.

THE EXPENSE

The farmer was charged 45c. an hour for the machine and a mechanic when actually employed. He also supplied the fuel and oil for the machine and board for the mechanic. The charge made was not sufficient to pay the cost of operation, and, in the majority of cases, the cost to the farmer was considerably less than the cost of ploughing with horses, the total cost per acre varying from $1.02 to $3.10, or an average of $1.60 per acre. The Department naturally met with difficulties in placing in operation so many tractors covering a large territory, the worst probably being the securing of competent operators. The men would sometimes be familiar with engines, but would know very little about ploughing, and frequently the opposite was the case. This fact led to further complications, such as engine troubles and difficulty with the ploughs. However, considering the fact that this was a new field of work, with no previous experience as a guide, the results in the main were quite satisfactory. Approximately 20,000 acres were ploughed in this way, 75% of which would not have been ploughed without the use of tractors. Another encouraging fact is that a large portion of land ploughed in this way was sown to fall wheat.

THE CALL OF THE DAY

If the need for greater production was important last year, it is many times more urgent to-day, and every effort is being put forth to have every possible acre under crop this year. Plans were completed some time ago for putting all the Government tractors in operation as soon as the season opened, and, with the benefit of last year's experience, it is expected that many of the difficulties met with then will be overcome. The services of the best mechanics employed last year have been again engaged, and assurances have been given by the Military Hospitals Commission that a number of returned soldiers who are being instructed on tractors will be available for this work.

WORK FOR AGRICULTURAL REPRESENTATIVES

Agricultural Representatives will again have charge of the tractors used within the borders of their respective counties. It will be their duty to secure contracts, route the machines, engage operators, and become responsible for the general supervision of the work. The difficulty in getting mechanics for making repairs resulted last year in a great loss of time and much inconvenience, both to the farmer and to the Department. In order to overcome this difficulty, the tractors are to be put in groups of from 12 to 15, the number depending on the distance they are apart, and an experienced mechanic will be placed in charge of each group. It will be his duty to inspect and repair all tractors under his charge, and in this way insure the proper care of the machines. Thus it is hoped to secure greater efficiency and to avoid serious breakdowns, which resulted at our first essay, not only in loss of time and inconvenience, but also in extra expense.. The operators in charge of the machines will be paid $2 a day and board, with a bonus of 25c. for each acre ploughed. Last year these men were engaged by the month It is hoped that the bonus system will make for greater

efficiency. In order that the overhead expenses in connection with the operating of tractors may be more nearly met, the Department has slightly increased the rates for ploughing and harrowing.

THE AGREEMENT

Following is the agreement farmers are required to enter into:

ONTARIO DEPARTMENT OF AGRICULTURE.
TORONTO.

Post Office Address.....

County..... 191
Township.....
Concession.....
Lot.....

I,.....hereby beg to make application to the Ontario Department of Agriculture for the service of a tractor outfit and operator. I desire to have.....acres ploughed, and will be ready to have the work done as soon as possible after above date.

In consideration of the Department being able to accept this application, I hereby agree to the following:—

To pay for work done at the rate of 50c per hour plus an additional charge of 50c for each acre ploughed, or 20c for each acre disc harrowed, provided that in no case shall the combined cost, as above stated, exceed $2.50 per acre for ploughing and $1.25 for disc harrowing;

To supply at the machine all fuel and water required, and to fill both tanks with gasolene and kerosene respectively when the work on my farm is completed, provided that the same has been done before the machine left the farm on which it worked immediately before coming to my farm, and that this has been taken into consideration in arriving at the amount consumed in the work on my farm;

To supply board and lodging for the operator while on my farm;

To sign a daily report to be submitted by the operator showing hours worked, acres ploughed, and such other information as may be required;

To pay accounts within thirty days after the work on my farm is completed.

I also agree that this application shall have the full force and effect of an agreement from the time said tractor outfit arrives on my farm.

Signed.....
Witness.....

FARMERS SHOULD BE OWNERS

While it is expected that a considerable amount of work will be done by the Government-owned tractors, yet the number of acres ploughed will be small as compared with the total acreage under cultivation in the province. To some this might suggest the advisability of the Government purchasing a larger number of tractors, but it must be borne in mind that such a policy would lead to an investment of an exceedingly large sum; besides this the difficulty of administrating the work would be greatly increased, with the result that efficiency would be seriously impaired. The solution of the difficulty would, therefore, seem to be that the farmer should own his tractor, and it is pleasing to note that a large number of farmers have already become owners of machines. There is also no doubt of the growing interest in tractors. This is easily shown in the large attendance of 155 at the first Farm Power Course held at the Ontario Agricultural College in January of this year.

RESULTS OF EXPERIENCE

From the experience gained by the use of Government-owned tractors last year, it would appear evident that the tractor will eventually find its place on many farms in the province of Ontario. This will mean, of course, that fields in many cases will have to be rearranged and made larger, as there is great loss of time in turning the tractor at the end of the furrow. For this reason it would seem well not to have the fields less than 15 acres. It has been clearly demonstrated that tractors are unsuited on farms that are hilly or stony. The machines experience much difficulty on hilly land, and on stony land difficulty is met in keeping the ploughs properly adjusted, besides there is danger of bending beams and breaking plough points. While tractors will undoubtedly replace horses to a considerable extent, their value will be largely found in taking care of the peak load on the farm: in other words, they will be

found extremely valuable during spring for seeding operations, and, again in the fall, for ploughing. They will also take the place of the stationary engine for such work as threshing, grinding, sawing wood, pumping water, etc.

CARE REQUIRED IN BUYING

The selection of a tractor is a matter for careful consideration. It would be difficult to recommend any particular type, as there are a number on the market which have given fairly good satisfaction under field conditions. The purchaser must be guided to some extent by his own requirements, and the amount of money he is prepared to invest. Generally speaking, however, a tractor should not have less than 9-18 horse-power to do the work required of it on the general run of Ontario farms.

Having secured a good tractor, it is most important that it be put in the hands of a competent operator. Many of the difficulties encountered are more largely due to lack of care and improper use than to any weakness in the tractor itself. A tractor is an expensive piece of machinery, and, if the best results are to be secured, it will have to receive much greater attention than is usually given to machinery on the average Ontario farm.

TRACTOR SCHOOLS

THREE-DAY tractor schools were held at the towns of Preston and Ayr in the month of March. The classes were arranged by the Agricultural Representative of the county, Mr. J. S. Knapp, and were conducted by Mr. W. H. Day, Professor of Physics at the Ontario Agricultural College. The attendance varied from fifty to sixty at Ayr and from sixty to seventy at Preston. A sectionalized gasoline engine was used to demonstrate the lectures which covered:

1. The general purpose of gasoline engines.
2. Electricity.
5. Carboration.
4. Ignition.
5. Operation, care, and troubles.

An expert operator supplied by a manufacturing institution assisted in the demonstrations.

CO-OPERATIVE SHORTHORN SALE

BY N. C. MACKAY, AGRICULTURAL REPRESENTATIVE, BRUCE CO.

THE second annual sale held recently by the Bruce Shorthorn Club was very satisfactory. About 400 farmers and dealers were present. We had several buyers from the West, but they were only able to get two old enough to ship. Due to the fact that we did not plan on having a sale until a month before it was held, most of the animals that were offered were only about six months old, as the breeders did not hold anything for the sale. Only two sold for less than a hundred dollars, ninety dollars being the lowest price secured. The highest price was $170.00 for a calf only a little over a year old. The average price was $130.00. One of the pleasing features of the sale was that many small breeders who were rather sceptical were forced to admit that the animals that were auctioned generally brought a good deal more money than they were holding theirs at, and we do not anticipate any difficulty in getting a much larger number of contributors for 1919.

SEED POTATO INDUSTRY FOR NEW ONTARIO

A movement is in progress within the Department of Agriculture of Ontario to establish the growing of seed potatoes as an industry in especially suitable districts of New Ontario. Three cars of selected and approved potato seed of the Irish Cobbler and Green Mountain varieties have been procured from the province of New Brunswick. These are being distributed to farmers in the districts of Muskoka and Parry Sound, Algoma and Fort William. From three to four meetings were held in each of these districts with a view to securing the intelligent co-operation of the farmers. The staff of speakers consisted of Dr. C. A. Zavitz, Professor of Field Husbandry, Ontario Agricultural College, Mr. Justus Miller, Assistant Commissioner of Agriculture, and Mr. A. H. MacLennan, the vegetable specialist of the Department of Agriculture. Two of these speakers addressed each of the meetings. The meetings were organized by the respective Agricultural Representatives for those districts.

PROFESSOR OF ANIMAL HUSBANDRY AND FARM SUPERINTENDENT, ONTARIO AGRICULTURAL COLLEGE

MR. Wade Toole, B.S.A., whose appointment as Professor of Animal Husbandry at the Ontario Agricultural College was announced in the April GAZETTE, assumed his new duties on the first of May. Professor Toole will also be Farm Superintendent. His immediate staff will consist of Mr. H. M. King, B.S.A., Lecturer in Animal Husbandry, and official in charge of the cattle and horses of the college farm; Mr. J. P. Sackville, B.S.A., Lecturer in Animal Husbandry, who will be in charge of sheep and swine; and Mr. Andrew Leitch, B.S.A., as Farm Manager. In addition Mr Leitch will continue to direct the farm management surveys under the immediate direction of President Creelman.

MR. WADE TOOLE, B.S.A.

MANITOBA

THE WEEDS COMMISSION

BY GEO. BATHO, EDITOR OF AGRICULTURAL PUBLICATIONS

THE Manitoba Weeds Commission, on March 20th, held at Sinclair, Man., the last meeting of a series that has continued all winter, and that covered a total of 70 places visited.

The total attendance at these meetings was 3,691 persons, some of the best audiences turning out when the weather was very uninviting. An encouraging feature of the gatherings has been the keen interest taken by reeves and municipal councillors. It is part of the work of the municipal councils to engage the municipal weeds inspectors, and, therefore, it is a healthy sign when they show themselves anxious to understand the work that the inspector has to do and a sympathetic desire to help him make his work effective. In one case, for instance, the reeve attended three different meetings held in various corners of his municipality.

Lantern slide illustrations were used not only to show the weeds of principal interest, and to illustrate their root systems, foliage and manner of bloom, but also to show the actual field results obtained by different methods of work in several parts of Manitoba. Some of these photos were taken in heavy crops of wheat growing in 1917 in fields that had been condemned on account of sow thistle in 1916, and had been thoroughly summer fallowed for the remainder of the season. The importance of apparently small matters in soil culture was strongly pushed home both by Messrs. Bedford and Brown, and the presentation of actual photos taken in the field made a convincing appeal.

In addition to grown-ups at the meetings the senior pupils and teachers attended at quite a number of points, and so a most practical lesson was added to the agricultural instruction which is being given in the school.

At the close of the formal addresses a very valuable aftermath showed itself at many places in the way of round table talks, participated in by those who were especially interested in some particular phase of this very large and difficult problem. So intense was the interest and so anxious were those present to secure all possible suggestions that these group discussions often lasted one or two hours.

The commissioners express much satisfaction at the gradual improvement in the type of men appointed as weeds inspectors by most of the municipalities. Municipal councils have for the past two seasons been urged to select men past middle age who have "made good" at farming on their own account, but who may be unable to do the most active kind of work in the field. Probably over one-half of the inspectors own autos, and use these in their work. The effect of securing men of this type for this position is that the Act is administered with sympathy and judgment, and with more emphasis on cleaning cultivation with tillage implements, and less use of the mowing machine after the crop is grown.

EXHIBITS AT FAIRS AND EXHIBITIONS

BY T. J. HARRISON, B.S.A., PROFESSOR OF FIELD HUSBANDRY

DURING the past season the Manitoba Department of Agriculture and the Agricultural College have made considerable use of exhibits at the fairs and exhibitions to teach the farmers within the province the advantage of better agricultural methods, and to advertise to the farmers outside of the province the agricultural possibilities of Manitoba. The exhibits, that were prepared, can, therefore, be divided into two classes, those designed to teach, and those designed to advertise.

EDUCATIONAL EXHIBITS

The educational exhibits were designed and prepared by the staffs of both the Department of Agriculture and the Agricultural College and were shown at fairs within the province. At these fairs members of the staffs were present to explain the exhibit, if necessary, and to answer other enquiries made by the farmers.

EXHIBIT AT BRANDON SUMMER FAIR

The exhibition of the Western Agricultural and Arts Association held in the city of Brandon is one of the largest fairs held in Western Canada. It was for this exhibition that the biggest exhibit was prepared. The space occupied was 150 feet long by 14 feet deep. The decoration and general design of the whole exhibit were under the direction of Mr. Louis Kon of the Immigration and Colonization Branch, and great credit is due him for the artistic arrangement of exhibits and signs, and the background. The exhibit was divided into twelve

MANITOBA PROVINCIAL EXHIBIT, PEORIA, ILL., SOIL PRODUCTS EXHIBITION

divisions. The material in each was prepared and exhibited by the different departments of the college and branches of the Department of Agriculture. In each division an endeavour was made to bring out just one idea.

The poultry exhibit, under Professor Herner, specialized on better market eggs. The exhibit was designed to show the best methods of egg production and transportation of the eggs from the farmer to the consumer.

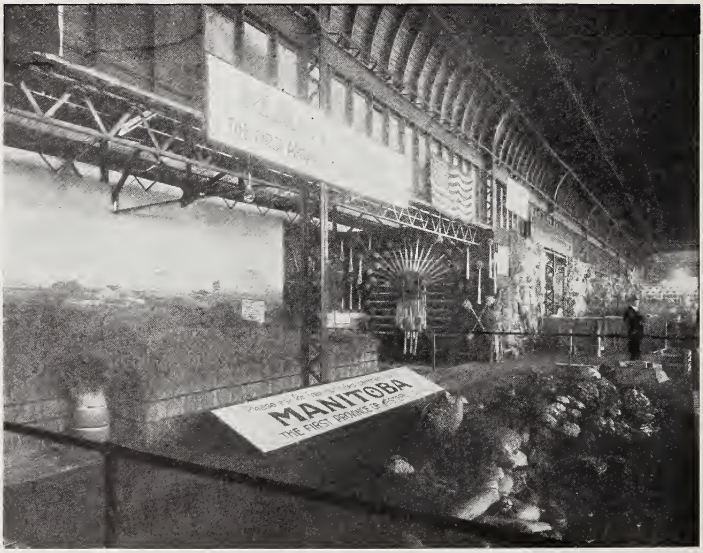
The dairy exhibit under Dairy Commissioner Gibson endeavoured to teach improvement in Manitoba butter production.

The apiary displayed under the Provincial Apiarist, showed by signs and exhibits of honey and live bees that bee-keeping in Manitoba was a profitable line of farming and not a fad.

Beautify the home surroundings was the message of the Horticultural Department, where Professor Brodrick stood sponsor. A lesson here was taught by having a model home and good surroundings.

Destroy the gopher and weeds was the message of the Biological Department under Professor Jackson.

The Publications branch of the Department of Agriculture showed how it was possible to start a good agricultural library with little or no cash outlay.



MANITOBA EXHIBIT AT STATE FAIR, SPRINGFIELD, ILL.

The Household Art Department had an exhibit showing what a first-year student at the college learned in garment making, millinery, house planning and home adornment. This exhibit was under Professor Margaret Kennedy.

The Field Husbandry Department endeavoured to show that it was the duty, and not the privilege, of every farmer to produce to the utmost. This exhibit consisted of miniature elevators and revolving placards.

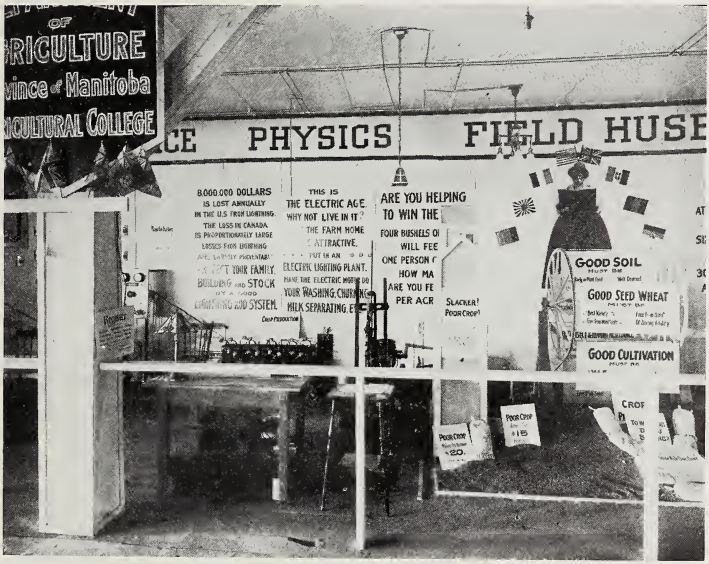
The Physics Department, in charge

of Professor S. C. Lee, had an exhibit showing two methods by which that department could be of use to the farmers. Demonstrations were given three or four times daily on the effectiveness of lightning rods in protecting farm buildings. The main part of the exhibit consisted of a well-equipped farm electric lighting plant.

The Extension Service had a complete exhibit showing the use of

SECTIONS OF BRANDON EXHIBITS AT RURAL FAIRS

After the Brandon fair was over, Professor Herner took the Poultry exhibit to the Agricultural Society fair at Virden, and Miss Kennedy the Household Art section to the summer fair at Souris. The management of both these fairs were loud in their praise of these exhibits and were anxious to secure a similar collection for their exhibition next year.



MANITOBA AGRICULTURAL COLLEGE EXHIBIT AT BRANDON

gasoline engine in driving a cream separator, churn and wash machine, etc. They also emphasized the necessity of home canning of vegetables and fruits. In addition to the general exhibit demonstrations were going on almost continually in the auditorium in the centre of the building on canning, cooking, killing and dressing chickens, lightning control, etc.

THE FIELD HUSBANDRY EXHIBIT

The Field Husbandry department of the Manitoba Agricultural College, assisted by the extension service, were the first of the Manitoba Agricultural College departments to make a move towards placing an exhibit at the rural agricultural fairs within the province of Manitoba.

The exhibit, which was firstly set up at the Agricultural College, was made interesting, instructive and

educational, comprising three divisions, namely, 1st, grain section; 2nd, farm section, and, 3rd, grasses and clover section.

The grain section consisted of six varieties of each of wheat, oats, and barley arranged in order of their yields made in a three-year test on the experimental plots of the college. In the centre, near the back was placed the sweepstake wheat of 1917, and, on either side, the sweepstake wheat of 1915-16.

The farm section consisted of two representative half sections: one divided for a six-year rotation, and the other for a four-year rotation. The six-year rotation, or mixed farm, comprised fields consisting of fifty acres and containing one field of corn, two of wheat, one of oats and one of barley, one of hay and pasture, the rotation followed being 1, wheat; 2, wheat; 3, oats or barley seeded down to hay; 4, hay; 5, pasture, broken in July, and 6, corn or summer-fallow. The total profit of this farm was $9.61 per acre.

The four-year rotation or grain farm was divided into four sections of 75 acres each; two fields for wheat, one for oats and one for summer-fallow. The rotation followed was 1, wheat; 2, wheat; 3, oats, and 4, summer-fallow. The total profit of this farm was $3.11 per acre.

The grasses and clover section was arranged in order of their suitability to Manitoba and their rate of production. In front of the case containing these were placed jars containing three recommended varieties of corn, and those given out for the corn contest, namely, Minnesota No. 13, Early Gehu, and North-Western Dent. Two other jars in the foreground showed the result of two-year selection of ears and kernels had upon the increase in production and uniformity of cob, etc.

The background of this exhibit consisted of beaver board charts eight feet high. Upon these were printed the yields and length of time in maturing of grains and grasses. These were placed behind their perspective sections, while the centre section had as its background the results of rotation experiments on the mixed and grain farms. The border of each chart was decorated with either sheaves of wheat, oats or grasses and clovers. Spaces at the top and bottom were filled with pictures of noted cattle and sheep and other experimental work at the college.

This exhibit was sent out on July 3rd in charge of Geo. C. Simpson to fairs at Morden, Melita, Hartney, Deloraine, Cartwright, Crystal City and Boissevain. The exhibit was heartily welcomed at each of these points, and on an average at the seven fairs, five to seven hundred people stopped to ask questions regarding many of the agricultural problems, such as:

(a) Suitability of corn in Manitoba for fodder.
(b) The working out of six-year rotation.
(c) The identification of weeds and their eradication.

Bulletins upon the field husbandry subjects were distributed, and those wishing other bulletins were given the list of the college bulletins, which could be obtained free of charge from the college.

IMMIGRATION AND COLONIZATION BRANCH EXHIBITS

The Immigration and Colonization branch of the Department of Agriculture, under the direction of Mr. Louis Kon, prepared and showed exhibits at many of the state fairs in the United States. The exhibits at Springfield and Peoria, Illinois, were of exceptional merit. These exhibits have had a remarkable effect on the immigration to the province of Manitoba. The best evidence that the exhibits were a success is the following quotation from the review of the Spring state fair in the *Breeder's Gazette*:—

"A choice space was filled by a Manitoba exhibit, displayed with the cunning of a Canadian hand in such affairs. It sought to tole away Illinois farmers at a crisis in American agriculture."

THE MANITOBA SOIL PRODUCTS EXHIBITION

BY S. T. NEWTON, DIRECTOR OF EXTENSION SERVICE, DEPARTMENT OF AGRICULTURE

THE Manitoba Soil Products Exhibition was held during farmers' week at Winnipeg, and proved the most successful show yet held in the province, no less than 175 individual exhibitors having entries, while the total number of entries was over 400.

In addition to the excellent cash prizes given by the Government, thirty splendid special prizes donated by the Winnipeg business firms served to arouse a great interest in all departments.

The prizes were evenly distributed over the province, a noticeable feature being that many of the best prizes, including the grand championship, were won by men who are members of the Canadian Seed Growers' Association. Brockington Brothers, of Melita, in the south-western corner of the province, won the highest honours in wheat, while the second highest went to J. W. Carruthers in the centre of the province, and third to S. Larcombe of Birtle, in the north. First place in oats was won by R. B. Dickinson of Birtle, and the second place by M. P. Mountain of the same place. The prize winning barley was grown by J. F. Symonds, Elkhorn.

In the north-western district there was only a difference of 1¼ points between the first prize sample and the one that got eleventh prize.

There were ten entries in Marquis for every one in Red Fife, thus showing that Marquis is steadily forcing Red Fife out of the province.

This year the boys' and girls' clubs were represented by fifty-one entries, and the quality of the grain shown by them proves that in the near future they will be contending for the very best prizes.

In potatoes, the quality and the number of entries were very gratifying, no less than sixty-three exhibits being placed.

SASKATCHEWAN

CO-OPERATIVE POULTRY MARKETING

BY W. W. THOMSON, DIRECTOR CO-OPERATIVE ORGANIZATIONS

THE co-operative poultry marketing work of the Saskatchewan Department of Agriculture has just been completed for the 1917-18 season, and we are pleased to be able to state that the season's work has been the most satisfactory yet experienced, both in regard to quantity of poultry handled and prices realized. This work was first undertaken in the fall of 1915, its object being to encourage poultry raising, first by providing a market where farmers and others interested in poultry raising could dispose of their surplus stock for cash rather than for trade at local stores, as was the usual practice, and, second, by marketing in such a way that the producer was assured the full dressed value of his product, less the actual cost of handling.

The actual carrying out of the project was undertaken jointly by the Co-operative Organizations Branch of the provincial Department of Agriculture and the poultry husbandry department of the Saskatchewan College of Agriculture. A poultry killing and marketing station was opened in Saskatoon in the late fall of 1915, and poultry producers

were invited to ship their birds in alive to the station. When birds were received at the killing station they were graded, weighed, killed, dressed and packed under the supervision of experts provided by the College of Agriculture. Representatives of the Co-operative Organizations Branch then took charge of the dressed birds and forwarded advance payments to the shippers at prices which had previously been advertised, funds for this purpose being supplied under the provincial Agricultural Aids Act. The dressed poultry was either sold at once, or, if the market was not favourable, was placed in cold storage and sold when prices had advanced. When all of the birds were sold, a final payment was forwarded to the producer, returning to him every cent realized from the sale of his birds, less the actual cost of transportation, killing, boxes, and storage charges.

PROGRESS OF THE MOVEMENT

This system of marketing has proven very satisfactory, and large quantities of poultry have been handled each season. During the first season only one killing station was operated. In 1916, two stations were operated, one in Saskatoon serving the northern part of the province, and one at Regina for the southern section, both stations being operated for five weeks beginning November 13th. In 1917, these stations were again operated for five weeks beginning November 5th, and in addition a sub-station was operated at Tantallon for the week November 5th to 10th. The advance payments have always been about equal to the local market prices, and a final payment of from 1c to, for some grades, as high as 4c and 5c per pound has been paid in each year. The following is a list of the advance payments paid during the past season, payment being based on the live weight in each case: No. 1 chicken, 14c per lb.; No. 1 fowl, 12c per lb.; No. 1 duck and geese, 14c per lb.; No. 1 turkeys, 18c per lb.. Second-grade birds were paid for at 3c a pound less than No. 1's of the same kind.

The following table shows the quantity of the various grades of poultry received at each of the killing stations operated during 1917, and also the average set price realized for each grade and kind. The prices quoted are those realized on the live weight in every case. The expense of handlingi ncluding grading,killing, boxing, storage, and insurance, amounted to approximately 5c per lb., leaving a considerable amount to be distributed as final payments on almost every grade.

LIVE WEIGHTS

Grade	Kind	Regina	Tantallon	Saskatoon	Total	Average price realized on live weights.
		lb.	lb.	lb.	lb.	lb.
1	Chicken.....	9336	1904	11421½	22,661½	23c.
2	"	4346	991	2602½	7,939½	19c.
3	"	163	13	402	578	12c.
1	Fowl.....	9748	2295	8317	20,360	19c.
2	"	2539	1322	2064	5,925	16c.
3	"	46	2	413½	461½	9c.
1	Turkey.....	5858	387	6446	12,691	29c.
2	"	1010	162	1411	2,583	25c.
3	"			120	120	12c.
1	Duck.....	1761	189	2081	4,031	20c.
2	"		24	155	179	16c.
1	Geese.....	482	555	1135	2,172	21c.
2	"		38		38	16c.
TOTALS		35,289	7,882	36,568½	79,739½	

ALBERTA

ORGANIZATION FOR INCREASED CROPS

BY J. McCAIG, EDITOR OF GOVERNMENT PUBLICATIONS

THE Department of Agriculture for Alberta has entered on a vigorous campaign, covering the whole of the province for increased crop production and increased breaking for cropping in 1919.

The system adopted is the subdividing of the province into districts, fifteen in number, in the centre of which a field agent is placed with proper office and transportation equipment. The centres at which work will be carried on are Spirit River, Edmonton, Vegreville, Vermilion, Wetaskiwin, Lacombe, Sedgewick, Youngstown, Olds, Calgary, Claresholm, Lethbridge, and Medicine Hat. The agents are being selected largely from the instruction staff of the agricultural schools who have already proved themselves efficient in extension and school fair work.

LABOUR MOBILIZATION AND RE-SETTLEMENT

The duties which the agents are expected to discharge take account of the utilizing of all the labour and power resources of the province. In preparation for increased production half a dozen labour bureaux have already been established in the province for the enrolment of available help, both male and female. At present there is a surplus, but it is expected that before May 1 the demand will have absorbed the total supply available. Labour bureaux are operating at Medicine Hat, Lethbridge, Calgary, Red Deer, and Edmonton to date. A number of returned soldiers make up part of the present supply. Returned soldiers who have been brought up on farms obtain work quickly, or go on land of their own. The plans of the Department take account of providing for the inexperienced town or city soldier who wants to go on land. In fact the Department is giving chief attention to absorbing the largest possible number of returned soldiers by having them take up home-making on the land for the sake of the recuperative offices of country work. Homes are to be sought among experienced and public spirited farmers, to educate these men in the operations of the farm, in order to qualify them for the land settlement loan provided by the Dominion for returned soldiers.

HOW MORE CROP IS SECURED

The features of the cropping propaganda carried on by the field agents will be: the increase of seeded areas where the land is in suitable condition; the carrying on of new breaking; the fullest use of power resources by moving of teams and tractors, where work is completed, to farms requiring more power; the securing of supplies of good seed, where required, with the aid of the provincial seed branch; the control of weeds, and the furnishing of help and advice on all problems of the farm. In areas where tractors are in common use, the field agents will be the mechanics and gas engine instructors of the agricultural schools. There are not fewer than a thousand tractors now in the province, over two hundred of which have been placed through the office of the Department of Agriculture.

BRITISH COLUMBIA

FARM COST ACCOUNTING

BY A. B. TWEDDLE, PROVINCIAL STATISTICIAN

RECORDS of the cost of producing farm products stand ready to serve the same economic purpose as the cash register in a mercantile business by stopping leakage. Of all the industries in the world agriculture is the greatest, the most varied and complicated, and yet the only one in which accounting has so far been of secondary consideration, hence the annual leakage must be large. Time, effort, and vast sums of money have in the past been spent in gaining knowledge of plant and animal production, and in educating farmers in a like way, but up to the last ten or fifteen years little thought was given to the business side of farming, and yet it is probable that more farmers fail financially from a lack of proper business methods and records than from ignorance in handling land, plants, or animals, or because of poor production. The average farmer is already a naturalist and arduous labourer, but few possess the knowledge of business principles necessary for merited success.

Years ago when farmers lived largely on the products of their farms, and bought and sold very little, records or accounts of any kind were not so essential. Conditions, however, suddenly changed. Machinery was introduced in the factory and on the farm. Farmers began selling most of their products and buying necessities. Land, which could be had almost for nothing, became high priced, the standards of living changed, so that the farmer had to become a mechanic and business man as well as a naturalist and labourer. He had to develop efficiency to organize his farm as a successful business enterprise.

ADVANTAGES OF ACCOUNTING

It is in such organization that well-kept records of the farm transactions, or operations in the past, are an essential factor. By such records the farmer is better able to know which branch of his farm is being operated at a loss, and which has proven most satisfactory. He then knows which branch to eliminate entirely, and which to strengthen in order to meet changed demands.

Such records are also a safe guide to the farmer in the marketing of his products, since by them he knows exactly what it costs him to produce, and, by studying and analyzing such statistics as will show him total production, supply, and demand and market prices, he is in a position to know when to sell, and the price he should ask in order to secure the desired profit. Having gained such knowledge, he also fortifies himself against unscrupulous middlemen, who might otherwise fatten upon his ignorance of the true conditions of the market.

Cost accounting has long been recognized by manufacturing and other industries to be as important as regular financial accounts, but only in comparatively recent years has this subject come prominently into the lime-light in its relation to the farming industry, and is now being more discussed than ever before in the history of agriculture.

IN THE UNITED STATES

Such work has been conducted by universities and agricultural colleges

in the United States for at least fifteen years, and with very satisfactory results; in fact, so much so, that curricula now include "Farm Cost Accounting." Departments of Agriculture are now making such work a part of their regular activities.

Some systems adopted required the services of a field official, whose duty it was to call upon those farmers keeping records, every few days, and even remain on a farm two or three days in succession in order to render assistance. Attempts were made to get farmers to keep certain definite accounts themselves without any assistance, but results were not very satisfactory. It was then that what is known as the diary system was adopted, which allowed the farmer to tell his daily story in his own accustomed manner, and at the end of the year the required records were extracted and compiled by the government office or universty for the use of the farmer in the future. This system at once became popular among farmers.

The British Columbia Department of Agriculture are this year adopting this system in principle.

A number of chosen farmers are co-operating with the Department in that the records are kept by the farmers. The Department will undertake to compile these records at the end of the year and submit a statement to the farmer, along with his diary, which he may have for reference and guidance. A complete inventory of the farm at the beginning and another at the end of the year is required, which serves as the basis. From results, it will be possible to not only see how a particular farm business stands as a whole, but in respect to its various branches as well.

The longer such records are kept the more valuable they will become to the farmer, for not only will they be better kept from year to year, but future calculations can be based upon an increasingly reliable average of the past.

SIMPLICITY OF THE SYSTEM

Every effort should be made to stimulate interest in this work. Since such a simple system is now available every one of our farmers should avail himself of the opportunity to become enlightened regarding his farm business.

The fact that our farmers are to-day doing all that is physically possible towards greater production is heartily appreciated, and in view of this fact it may seem hard to devote time to keeping records. The keeping of the records in accordance with the diary system does not require more than five to eight minutes per day where the entries are made daily. The inventory may be largely made during rainy days, whilst the compiling is done during a slack period. Such work will furnish evening employment for members of the family the year round, and will stimulate greater economy and interest in the farm business.

In consequence of the scarcity of country elevator agents, the North-West Grain Dealers' association, the headquarters of which are at Winnipeg, has appointed a committee of seven to organize a school of instruction for such men, the idea being to offer this education to returned soldiers, whether they are at present employed or not, so as to better equip them for the necessary work of the country.

PART III

Junior Agriculture

DEMONSTRATIONS, COMPETITIONS, AND CLASS-ROOM STUDIES IN RURAL LIFE FOR BOYS AND GIRLS.

Of the activities dealt with in this section of The Agricultural Gazette this month, several are wholly, or in part, fostered and encouraged by grants derived from allotments of funds under The Agricultural Instruction Act. Boys' and girls' competitions (see page 507) get direct support in this way of $2,000 each in Nova Scotia and Quebec. In other provinces aid practically in the same direction is given under different headings (such as grants to school fairs). Clubs for boys and girls (see page 513) are immediately financed from the federal grant to the extent of $2,000 by New Brunswick, $1,000 by British Columbia, and $17,000 by Manitoba. Under the heading of teaching agriculture (see page 509), household science, etc., Ontario has set down from the federal grant $30,000, Saskatchewan $25,000, and British Columbia $20,000. Directly for household, or domestic science, Quebec (see page 516) devotes $10,000 from the federal grant.

FINANCIAL AID FOR PIG CLUBS

ONTARIO

BY G. B. CURRAN, B.S.A., AGRICULTURAL REPRESENTATIVE, LENNOX AND ADDINGTON

THE Merchant's Bank of Canada have set aside $1,500 for the formation of a boys' and girls' pig club in Lennox and Addington county. The plan is as follows:—

The bank supplies each child with a registered Yorkshire sow, 6 to 8 weeks old, and also with a grade pig of the same age. The child signs a note to the bank for the actual cost of these pigs, the loan to be repaid when the grade pig is sold for meat purposes in the fall of 1918. The father must sign an agreement that he will supply the feed for the pigs and give the child every encouragement and guarantee that the child will repay the loan. By this plan every child who enters the pig club will own a pure-bred registered Yorkshire sow next fall. Applications are already pouring in from all parts of the country. The Merchant's Bank of Canada is encouraging this pig club work for the sole purpose of improving the bacon industry in Lennox and Addington county.

ALBERTA

BY J. McCAIG, EDITOR OF PUBLICATIONS

W. J. Elliott, Principal of the Olds School of Agriculture, has been given the work of organizing boys' and girls' clubs for the raising of pigs in Alberta this year. Mr. Elliott has a critical knowledge of this class of live stock and is well qualified to manage

co-operative work among young people. He conducted two or three clubs last year as an extension interest from the school and had good results. This year he will promote a number of new clubs and give assistance in the organization and management of a number that have been started by bankers, secretaries of agricultural societies, and other business men. The bankers especially have shown a wholesome interest in developing the care of stock by the young people of the farm, and the Department will make it possible for this interest to realize itself profitably to all concerned.

The plan being followed this year is that the Department organizer will purchase the stock, distribute it, give instruction in the care of it, arrange the fair prize list and supply judges. The banker will choose his club membership, finance the young people, keep track of their operations during the season, and help to finance the prize list. The enterprises may be the raising of two pure-bred young sow pigs, one of which will be sold to pay for the pair, the feeding of a pair of young butcher pigs, or the raising of litters. The Department has issued two simply written bulletins, one on the organization and operation of pig clubs and the other on care and management.

It is expected that the number operating this year will be kept down to about twenty-five in order to make sure of good management and supervision.

BOYS' AND GIRLS' COMPETITIONS

SASKATCHEWAN

BY JOHN G. RAYNER, B.S.A., DIRECTOR, BOYS' AND GIRLS' CLUBS, EXTENSION DEPARTMENT, COLLEGE OF AGRICULTURE

NO definite organization plan, or set of rules and regulations, has been outlined for the direction of the boys' and girls' club work in Saskatchewan for this year. It is felt that the club work is of such importance that it would be wise to take time to look into the movement as carried on in other provinces and profit by the combined experiences of these before deciding upon a definite plan. Accordingly for this year a circular was addressed to all agricultural societies urging these societies and any other interested bodies to arrange for special competitions for the boys and girls, exhibiting the products of the contests in the fall under whatever auspices seemed advisable; and then next year the work will be continued under a definite organization plan.

While all competitions will be encouraged, special emphasis is laid on pig raising, poultry raising, and potato growing contests. These three projects will direct the abundant energies of the boys and girls toward the production of three of the most wholesome foods we have and which can be produced more rapidly and abundantly than most other foods. And in additon to aiding in production, they will give the contestants the advantages of ownership and business training, and will provide them with the stimulation of expressing themselves in terms of achievement and contest.

For the general guidance of those arranging for these contests the following principles were given:

"While the immediate value of these contests would be the assistance to the greater production campaign, it must be kept in mind that the ultimate object of the work is largely educational, and in this connection the following points should be observed:

"A thorough report kept by the boys and girls of the work they do will make them take much more interest in the contests, and make them of more value throughout.

"Community breeding should be encouraged; that is, only one breed of pigs, and of the bacon type, should be used in any community and similarly with poultry. The advantages of this will be obvious.

"The contest material, such as pigs and poultry, should be paid for in some way by the exhibitor. Where material is given free the interest and sense of pride in the work is not so great. Ownership also gives the opportunity for business training. Suitable financial arrangements can be made with most of the banks.

"The giving of such prizes and shields, medals, ribbons, etc., should be encouraged rather than the giving of large cash prizes. And it is a good principle to offer a large number of small prizes making the chances of winning a prize greater, and, therefore, giving more encouragement, than to give only a few prizes of larger denomination.

"The girls should be encouraged to take part in these contests just as much as the boys. Experience with the boys' and girls' club work in many places has demonstrated that the girls take just as much interest in the contests, and show just as much ability as do the boys."

Boys' and girls' club work has been organized and carried on in some districts in Saskatchewan for some time, notably in the Weyburn Inspectorate, under the direction of Inspector A. Kennedy. The rules and regulations under which he carried on the work have been reported in previous issues of THE GAZETTE.

ALBERTA

GENEROUS AWARDS AT SUMMER AND WINTER FAIRS

A special prize list has been published giving details of the grand aggregate of $6,500, that is to be offered for girls' and boys' competitions, at the Calgary Industrial Exhibition, June 28th to July 6th, and at the Alberta Winter Fair, Calgary, December 10th to 13th. The competitions are open to girls and boys, residents of Canada, nine years or over and under seventeen years of age on the last day of the exhibitions. The animals exhibited may be pure-bred or grade, and need not be owned by the exhibitor, but the exhibitor must have fed, cared for, and fitted his or her entry from April 1st for the Industrial Exhibition and from September 1st for the Winter Fair, and must personally handle the entry in the ring or pen. Parents, guardians or employers are required to certify that the applicant is eligible as to age and has complied with the conditions of the competitions. One entry only can be made by an exhibitor in each class.

INDUSTRIAL EXHIBITION PRIZES

At the Industrial Exhibition prizes will be given as follows:

$600 for foals born in 1917, divided *pro rata* according to the number of entries actually shown, in Class 1, for heavy foals, and Class 2, for light foals.

$330 for ponies: 16 classes, 4 prizes in each, except in champion classes, for which champion and reserve ribbons are given.

$900 for calves born in 1917, divided *pro rata* for three classes, viz, beef steers, pure-bred or grade steers, heifers, pure-bred or grade; dairy heifers, pure-bred or grade.

$300 for sheep shearing contest for boys or girls, under seventeen years of age on July 6th, 1918, 50% being given for the time taken and 50% for quality of work.

$300 for pig growing contest, the sow to be of any age with a litter of pigs farrowed this year, 20% being given for number of litter and 80% for quality, uniformity, and condition of litter.

$150 for poultry for flock of five hens and one cock, Wyandottes, Rocks, Orpingtons, Rhode Island Reds, or Leghorns.

$150 for two one-pound prints of butter made in home dairy, wrapped in parchment paper.

$150 for single loaves of home-made bread from Government standard flour.

$109 for cooking tea biscuits, doughnuts, ginger snaps, and layer cake.

$97 for displays of wild flowers and of the orchid and lily families.

AT THE WINTER FAIR

At the Alberta Winter Fair, to be held at Calgary, December 10th to 13th, prizes as follows will be given:

$400 for Alberta Lamb Competition.
$2,275 for baby beef competitions (for steers) and Canadian heifer competitions, $1,500 to be awarded in two open classes and $775 in several special classes, in addition to the $250 challenge shield described in Vol. IV. of THE AGRICULTURAL GAZETTE, page 999.

Special prizes are offered for heifers and steers shown by girls; also by the different breed associations for steers and heifers exhibited by boys and girls.

In the Baby Beef Competition and Canadian Heifer Competition, the $1500 will be divided into 14 prizes, ranging from 17% to 2%. A special prize of $100 is offered if the winning steer is an Aberdeen Augus. His Honour the Lieutenant Governor offers a gold medal for the winner of the Canadian heifer competition. In addition, special prizes are offered for two grade heifer calves sired by a registered Holstein and shown in the dairy calf competition at the industrial exhibition.

GRANTS FOR TEACHING IN AGRICULTURE

ONTARIO

BY J. B. DANDENO, Ph.D., INSPECTOR OF ELEMENTARY AGRICULTURAL CLASSES

IN the schedules of grants to boards and teachers for maintaining classes in agriculture in the public and separate schools of Ontario, the grants for school garden work are not given separately as such, consequently, it might be well to give this fact briefly by itself. Where a board maintains classes in agriculture with a school garden, the grants to the board are $30.00, where a teacher is employed who holds a certificate in agriculture, and $20.00 where the teacher holds a second class certificate, but who has no certificate in agriculture. In order that these grants may be paid, the money must first have been spent, and an annual report made to the Department of Education. In 1917, there were 987 schools with classes in agriculture, and of these about 500 had school gardens. In graded schools, that is schools of cities, towns, and villages, the provisions are limited so as to include only such teachers as hold certificates in agriculture. The grants to boards may reach a maximum of $150.00 for each school, providing a number of classes receive regular instruction. The clause referring to such cases states: $20.00 for each teacher giving instruction in agriculture, not exceeding $150.00 for each school." It should be noted that the amounts specified include such sums as may be used for equipment other than that directly applicable to the school garden.

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

EARLY in September the Department of Education informed boards of trustees of secondary schools in the province of Saskatchewan, that a grant of $500 would be paid to any high school or collegiate institute district which made provision for a special course in agriculture as provided for by the regulations governing high schools and collegiate institutes.

All pupils who could satisfy the principal of the school as to their general fitness were to be admitted without further examination.

The payment of the grant was subject to the following conditions:

(*a*) The instruction in agriculture to be given by a teacher possessing the B.S.A. degree of the University of Saskatchewan, or other qualifications satisfactory to the Department of Education;

(*b*) The monthly average attendance in this course to be at least ten;

(*c*) The equipment provided for the course to be satisfactory to the Department of Education;

(*d*) The character and scope of the instruction to be in accordance with the requirements of the Department;

(*e*) The length of the course to be at least five months.

The course of study was outlined as follows:

1. *English.*—Reading and literature, composition, spelling, writing, public speaking.

2. *Mathematics.*—Arithmetic and mensuration, farm accounts and business forms.

3. *History.*—Canadian history and civics.

4. *Agriculture.*—(a) *Field Husbandry*—Plant growth, soils, tillage, crops—field and garden, fertility problems.

(b) *Animal Husbandry*—The place of farm animals in our agriculture; a brief study of types and breeds; care and management; horses; cattle—dairy and beef; sheep; swine; poultry.

Animal products, with special reference to milk and cream, butter, eggs, dressed poultry and wool. Production, care and marketing of animal products.

(c) *Implements and Machines*—A study of the kinds, suitability, care and management of implements and machines of the farm, tillage, seeding, harvesting, threshing.

(d) *Economics*—Farming as a business; agricultural resources; wealth and its production.

An elementary study of the following in relation to farming; insurance,—hail, fire, life, live stock.

Interest, taxes, rents. Banking, cheques, notes, drafts, bonds, deposits, bills of lading.

Trust and Loan Institutions, Co-operative Institutions.

With respect to the work in English, mathematics, and history, it was recommended that the courses of study for public and high schools be used as a basis for selection of material, due regard being paid to the ability and requirement of the class.

EQUIPMENT

The following is a list of the equipment suggested for the special course in agriculture:

1. Simple apparatus and re-agents as used for the teaching of elementary physics, chemistry and biology.
2. Thermometer, barometer, microscope, hand lenses, balance, lactometer, Babcock milk tester.
3. Collections of weeds and weed seeds; samples of grains, samples of fertilizers, specimens of farm and garden crops.
4. Soup plates, saucers, tumblers, flower pots, glass jars, etc.
5. Charts of types of farm animals, poultry, etc.
6. Agricultural library of reference books, reports, bulletins, pamphlets, etc.

The use of other material for demonstration purposes might be obtained by visits to neighbouring farms, grain elevators, creameries and implement houses.

DIFFICULTIES IN THE WAY

It was hoped that the College of Agriculture would be able to recognize this course as equivalent to a

portion of the work required for the associate diploma in agriculture, but owing to the fact that up to the present time no high school has been able to conduct such a special course the recognition of the course by the College of Agriculture has not yet been finally considered.

Several of the high schools and collegiate institutes of the province made earnest attempts to comply with the conditions and obtain a good number of students for the course. Many of the boards advertised the course very widely, and some conducted a personal canvass among the farmers of the neighbourhood. It was found that while many boys were anxious to take advantage of such a course the shortage of labour prevented them from leaving the farm for a period of five months.

A year ago, in the spring of 1917, such a course was conducted for the first time at the Estevan high school. About sixteen boys attended for a portion, or the whole, of the ten weeks of the course. Mr. C. M. Learmonth, B.S.A., was in charge of the special work in agriculture and was assisted by the other members of the staff of the high school. It was difficult for the boys to attend more than four or five weeks of the course and this year the board has found it impossible to comply with the conditions of the Department.

CONSOLIDATED SCHOOLS AND AGRICULTURAL EDUCATION

SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

OF the 19 consolidated school districts in Saskatchewan only a few employ more than two teachers. The size of a consolidated school district in this province is, on an average, only twice the size of an ordinary district. Hence the consolidated school in its equipment and organization differs very little from the average village or small town school. Instruction in agriculture, therefore, is no better organized in the consolidated schools as a class than in any of the other schools in the province.

The Cupar school district is one

DEMONSTRATION PLOTS GRIFFIN S.D., SASK.

of the best equipped of the consolidated schools in the province and employs four teachers, one of whom is responsible for high school work, including instruction in agriculture of the high school course of study. The district possesses about five acres of land and steps have been taken to protect this plot by a shelter be t, and prepared for use in connection with instruction in agriculture. A report on this district, with photographs, has already appeared in THE AGRICULTURAL GAZETTE. An article describing the work being attempted at Griffin school district was published in the November, 1917, issue. This district is not a consolidated district,

SCHOOL BUILDING, GRIFFIN, SASK.

to use a certain portion of it for experimental and demonstration plots.

The Creelman school district, although not a consolidated school district, has made preparations for the better teaching of agriculture by obtaining 10 acres of and which is being although consolidation is being considered. A professional gardener has been employed to care for the four acres belonging to the district, and to give instruction in the practical work of gardening and elementary agriculture.

COLD FRAMES, GRIFFIN S.D., SASK.

ALBERTA

BY R. A. BARRON, B.A., SUPERVISOR OF CONSOLIDATED SCHOOLS

THE policy of consolidation in Alberta is of comparatively recent date; the legislation permitting the consolidation of rural schools only being introduced in 1913, in which year one consolidated school district was organized. The following year two districts, in 1915 ten districts, and in 1916 sixteen districts were organized. At the present time we have about forty-six consolidated school districts, but it was only at the beginning of the present year that the policy of supervising these schools was inaugurated, and we have had scarcely time to get our bearings.

The distinctive phase of my work just now, and which will occupy my attention for some time, is the consolidating of our consolidations; that is to say, directing the operation, management, and academic work along lines which will make our rural consolidated schools truly rural and align them with practical agricultural life. This work is being undertaken in the midst of a very active campaign for organization in the consolidated districts, and we are now considering negotiations with over one hundred groups of units which desire consolidation.

BY JAS. C. MILLER, D.Sc., PH.D., PROVINCIAL DIRECTOR OF TECHNICAL EDUCATION

WE have now forty-six consolidated school districts, and this number will probably be more than duplicated in the course of the next two years.

The organization towards consolidation of rural schools having developed only during the last two years, it will be a year or two yet before they have matured their plans for special educational programmes.

In the majority of cases they are providing ample grounds for playground purposes and the teaching of agriculture, gardening, and tree planting. In many cases, also, they are providing a residence for the Principal. The buildings are in most cases planned to make possible the teaching of elementary handicraft, household arts, and elementary science as related to farm activities.

NEW BRUNSWICK

BOYS' AND GIRLS' POULTRY CLUBS

BY A. C. MCCULLOCH, POULTRY SUPERINTENDENT

IN taking up poultry work in New Brunswick the line which seems to require the most immediate attention is the improvement of the general class of stock kept on the average farm, and a considerable increase in the numbers maintained. Practically every farmer keeps poultry, but a small percentage of them have pure-bred stock and thirty-five or forty mature birds is considered a large flock.

Plans have been completed for the operation of a Boys' and Girls' Poultry club in each county, and several have already been organized. These clubs will serve as community breeding centres from which eggs and stock can be obtained for the formation of other clubs in neigh-

bouring settlements and in other parts of the county. A pedigree of each flock will be kept.

Each club member is supplied with fifty hatching eggs from high laying flocks or strains of Barred Plymouth Rocks. No charge is made for these at time of delivery, but in return the Poultry Division has its choice of four birds, mostly pullets, in the fall of the year, or fifty eggs the following spring. An important feature of the work is that for two years the breeding of pullets from eggs supplied, and their progeny, is subject to approval of the Poultry Division. This will prevent possible mating with inferior stock, and in two years' time each club member should have a good-sized flock of pure-bred, high-laying Barred Plymouth Rocks.

AIMS, RULES AND REGULATIONS

The following are the aims of the clubs, rules and regulations governing them, and a blank contract which the members sign when they receive the eggs:—

The aims of this club shall be:—

1. To increase poultry and egg production in New Brunswick.
2. To improve the quality of poultry and eggs produced in the province.
3. To study type in utility chickens.
4. To learn better methods for the production, care, and handling of poultry of all ages and in all seasons.
5. To hold a boys' and girls' poultry club fair once a year.
6. To study the marketing of poultry and eggs—when to market and how to prepare for market to secure the best returns.
7. To study all available literature on poultry husbandry.
8. To develop this district into a community breeding centre.

The officers of this club shall consist of:—

1. A president, vice-president, secretary-treasurer, and an honorary president and honorary vice-president.
2. Officers shall be elected for a period of one year and shall continue to hold office until new officers have been elected.

Rules and regulations:—

1. Club members must agree to the breed selected by the Poultry Division of the Department of Agriculture.
2. A club must have at least fifteen (15) members.
3. Boys and girls between the ages of twelve (12) and eighteen (18) years may become members of the boys' and girls' poultry club.
4. No boy or girl may join a poultry club without the consent of parent or guardian.
5. Boys or girls cannot join a poultry club unless they have the proper facilities to care for the poultry at all seasons of the year, or agree to provide the same according to instructions rom the Poultry Division Members must have proper feed available.
6. Members of the poultry club must mark their poultry of all ages in such a way as will distinguish it from other poultry raised on the same place. The members' club chickens should be raised in a separate place to other chickens if possible.
7. The club must hold an annual poultry fair in the fall of each year, the date selected subject to the approval of the Poultry Division. The poultry club fair sha l be held in conjunction with the pig club fair in the same locality, and if possible on the same date as the local fair of the district.
8. All members of the club must show all their chickens at the club fair.
9. An annual membership fee of twenty-five cents (25c) shall be paid to the secretary-treasurer of the club by each member at the time of joining. This money shall be devoted to carrying on the business of the club.
10. The annual meetings shall be held some time in January of each year, when the officers for the ensuing year will be elected by ballot. Club meetings shall be held regularly every two months in the months of January, March, May, July, September, and November. Dates of all meetings are subject to approval of the Poultry Division. This will permit the more frequent attendance of speakers arranged by the Poultry Division.
11. Special meetings may be called by the president at any time to transact important business.
12. The secretary-treasurer shall notify all members when either a special or a regular meeting is to be called.
13. Twice a year or oftener the Poultry Division will arrange for a representative to speak at the club meetings, and to discuss important problems with the club.
14. The Poultry Division will supply the president of the club with papers on poultry husbandry which shall be read at the regular meetings of the club by members appointed by the president. He shall also appoint a member to lead in the discussion after the reading of the paper.
15. I hereby agree to abide by the rules of the above club, and do everything in my power to promote its interests.

THE AGREEMENT

This contract made and entered into by and between..... party of the first part and..... .....party of the second part, both of the county of..... and province of New Brunswick,

Witnesseth:—That the party of the second part has this day secured from the party of the first part.....Barred Plymouth Rock eggs, which he or she agrees to take possession of and incubate according to instructions given by party of the first part.

That party of the second part further agrees:—

To raise, feed, house, breed, and market the chickens hatched from the eggs supplied, and their progeny, for two years, according to instructions from party of the first part.

To become, at the same time, a member of.....Boys' and Girls' Poultry Club, to bind himself or herself to abide by the rules and regulations of the club for two years to the best of his or her ability, to exhibit when called upon, all the chickens raised from the eggs supplied by the party of the first part, at the club poultry show.

To return to the Poultry Division a complete record each year for two years of all chickens hatched from eggs supplied, and their progeny, according to the provisions in record blanks furnished.

To return to party of the first part, in the fall of the first year, one strong healthy chicken for each.....eggs supplied (.....chickens), or in the spring of the second year the same number of eggs of as good quality as were supplies to him the first year, whichever party of the first part desires, and to sell to party of the first part, at a rate not exceeding..... cents each, as many other eggs laid during the hatching seasons of 1919 and 1920 by birds hatched from eggs supplied and their progeny, as party of the first part desires.

If sufficient chickens to fulfil this contract are not raised, party of the first part sustains the loss.

If for any reason either party shall fail to fulfil this contract, or any part thereof, he shall forfeit all right to the eggs, chickens hatched from them, or their progeny.

In testimony whereof the parties have hereunto set their hands this the..... day of.....191...

.....
Party of the First Part.

.....
Party of the Second Part

I hereby consent that party of the second part may enter into the above contract.

.....
Parent or Guardian.

ORGANIZING THE CHILDREN, THE TEACHERS AND THE TRUSTEES

BY R. P. STEEVES, B.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION

I am endeavouring to organize the children in the schools under the teachers and school trustees, with other interested citizens, for an effort to secure greater production this year. Our plan is to form an association in each centre, using the schools of the surrounding country as parts in the general plan. This association agrees upon a plan of a school fair, and immediately sets to work to formulate a prize list, which is published in every school and department. This sets forth to the children what work is to be in competition next fall, and serves as an objective in stimulating their efforts. This same association has a committee of management, which arranges for local supervision during the first five weeks of the summer vacation, so that children having plots will have assistance and encouragement during the growing period of their crop.

Each department, or school, elects a representative from among the children, who becomes a member of the association and assists in working out the plans. The idea is to give to each school its measure of responsibility and to link up school work with home effort. We seek to develop a public opinion in each centre and vicinity that will give the work a standing among the people and in the eyes of the pupils.

We hope by such efforts to have a

large number of fairs next fall that will include a great many more schools than in former years. Our idea is, if possible, for the children of New Brunswick to produce this year $150,000 worth of food, and yet not interfere with the attendance at school of those who enter into this work.

MANITOBA

GOPHER CAMPAIGN, 1918

TO increase production we must prevent waste. The gopher is the enemy of production. Let us keep submarines out of the wheat fields. Children can get the gopher and help production. Last year the school children of the province got 100,000 gopher tails in four days. This year, the Department of Agriculture, realizing the value of children in getting rid of the gopher, gave every possible encouragement, and extended the bonus for gopher tails from April 1st to May 10th. This enabled schools to obtain playground outfits, gramophone, etc., for if each child in a school of fifty had got twenty gopher tails a week, it would have meant $100 to that school.

The motto was: Get Together and Help Your School.

Gophers destroy millions of bushels of wheat each year. Most farmers will agree that gophers can and will destroy a bushel of grain each. The scarcity of grain and the high prices make this a more serious matter than ever before. With wheat at $2.21; oats at $1.00; barley at $2.00; and rye at $3.00 per bushel, we cannot afford to have gophers running away with it. There are, or were, not less than 10,000,000 gophers in the province. If half of them were working in the grain fields, the loss would be 5,000,000 bushels, which means $10,000,000 or more.

Such interest was taken in the gopher contests this year that Professor V. W. Jackson of the Biology Department of the Manitoba Agricultural College, put on a school competition, which, getting half-a-million gophers in April, was as good as two million gophers in June after each pair had raised a family of eight.

BRITISH COLUMBIA

DOMESTIC SCIENCE INSTRUCTION

ACCORDING to the report of the organizer of Domestic Science for the province of British Columbia, there are forty-five domestic science centres in the province. The subjects embodied in the course are well taught and great advancement in sewing and knitting has been made. Considerable attention has also been paid to economical cookery, as well as to canning and preserving of fruit, vegetables, and fish. The necessity for such knowledge has been amply demonstrated by the war. Teachers adopt many different methods of attaching the lessons in domestic-science centres, but they all practice those which are more or less scientific in character and discard those of a purely empirical nature. This instruction is already given to great advantage in the normal school at Victoria.

PART IV

Special Contributions, Reports of Agricultural Organizations, Publications, and Notes

THE QUESTION OF A NATIONAL FLOWER

CONSIDERED BY THE STUDENTS OF THE FREDERICTON, N.B., NORMAL SCHOOL

BY R. P. GRAHAM, INSTRUCTOR IN NATURE STUDY

THE reasons for establishing a national flower as outlined in the January number of THE AGRICULTURAL GAZETTE were explained to the classes of the Normal school, Fredericton, N.B., and the flowers suggested by the Ottawa Horticultural Society were discussed, in so far as their merits were then known. From this discussion, the following points arose and were tabulated for general consideration:

1. Is it a native flower?
2. Is it found all over Canada?
3. Does it express Canadian characteristics, sentiments or ideals?
4. Is it adapted for cultivation?
5. Will it grow under different soil and exposure conditions?
6. Is it adapted for use in educational work, e.g. drawing, painting, composition, literature, song?

Two weeks were given for general discussion and consideration and then the students were asked to vote on the primary question. "Is a National Flower Desirable?"

As our students represented all the counties of New Brunswick it was thought desirable to ask each student to suggest one flower that would be fairly representative of his or her own district, the list thus obtained to form the basis of further discussion before the classes and investigational work as to the merits of the different flowers by the students. The ballot used was of the following form:

County.....

I am (or am not) in favour of a National Flower for Canada.

and

I suggest .....

because .....

.....

Name.....

These ballots were fastened together in booklet form according to the counties represented, and the answers tabulated. The preliminary list of flowers thus obtained will form a basis for lessons and assigned subjects of study in our course, so that the respective merits, and lack of merits, of different flowers will have been brought before the student teachers before they go out to take charge of schools. Information has been obtained from Mr. F. E. Buck on the merits of the six flowers suggested by the Ottawa Horticultural Society, and these are under discussion by the classes at present.

The total votes cast in favor of a national flower were 213 with none against. The leading flowers were: violet with 111 votes, buttercup with 32, columbine with 16, and mayflower with 12.

REPORT OF THE COMMITTEE OF THE DEPARTMENT OF BOTANY, UNIVERSITY OF TORONTO

ON March 15th and 22nd, 1918, special meetings were held in the botany and forestry building, University of Toronto, for the purpose of discussing the question of the selection of a national flower for Canada. Professor R. B. Thomson, of the Department of Botany, University of Toronto, acted as chairman.

The meeting was well attended by representatives from the various educational, artistic, and practical institutions of the city, in response to invitations issued to the

various departments of the University of Toronto, McMaster University, the University Schools, the Faculty of Education, city collegiates, reference library, Ontario College of Art, artists, nature editors, the city Parks Department, the Ontario Horticultural Association, and the Toronto Horticultural Society.

THE MAPLE AS A NATIONAL EMBLEM

The first point brought before the committee was the question of the extension of the authorized use of the maple as a national emblem.

It was moved by Professor Smith, of McMaster University, seconded by Professor Keys, of Toronto University, and carried unanimously:

"that the maple be officially recognized by the Government as our national emblem, and come more definitely into our national devices."

The second point raised was as to whether the selection of a national flower would detract from the true significance of the maple. There was considerable diversity of opinion on this point, but the general feeling of the meeting was that the first motion would sufficiently protect the standing of the maple.

FOR THE SOLDIERS' GRAVES

The advisability of selecting a national flower, or of submitting a list of Canadian plants to be grown on the graves of our soldiers in Flanders, was next discussed.

A motion was put by Mr. Owen P. Staples, seconded by Dr. Faull, of the University of Toronto, and carried unanimously,

"that we submit to the Ottawa authorities a list of Canadian plants suitable for planting on the graves of our heroes in France"

The flowers selected were as follows:—Aquilegia, cornus canadensis, hepatica, trillium.

Dr. Faull moved, seconded by Dr. Coleman, University of Toronto, and the motion carried unanimously,

"that if a national flower be selected it be chosen from this list, but that the final decision be postponed until its horticultural possibilities be determined by experience in cultivation."

A PROVINCIAL FLOWER

The next three motions, all of which were carried unanimously, were:

"that we approve of the principle of a provincial flower."

"that, if it comes to the selection of a provincial flower, it be selected out of this list."

"that we recommend each of the other provinces be requested to submit a list similar to this."'

POPULARIZING THE MATTER

The next point under discussion was the desirability of gaining the ear of the teachers and school children of the country, and, ultimately, through them, the enlistment of the interest of the people. As an initial step in this direction Mr. Ivey of Harbord Collegiate, Dr. Cosens of Parkdale Collegiate, and Professor Thomson, University of Toronto, were delegated to represent the committee before the Teachers' Convention in Toronto.

POINTS OF FIRST IMPORTANCE

The following points in connection with the plants submitted were deemed of prime importance in the choice of a national or provincial flower:

1. The plant should breathe with the spirit of Canada, or of the province it is chosen to represent.
2. It should not be used by any other country or state.
3. It should be confined to a definite species, the best of its kind the world over.
4. It should have no horticultural rivals.
5. It should have its widest distribution in the area which it is selected to represent.
6. It should admit of easy propagation under various conditions of soil and climate and yet not become a noxious weed.

THE OTTAWA LIST

According to these criteria the following points concerning the plants submitted by the central committee at Ottawa should be noted:

I. *Aquilegia.*—(1) It is more representative of the United States and of Europe than of Canada.

(a) Rhydberg's new Flora describes 19 species in the Western States alone, six of which occur in Western Canada, but are of wider distribution in the States.

(b) Bailey gives ten European (mainly Russian forms).

(c) The only form found in Eastern Canada is the species Aquilegia canadensis. This is just as typical of the States and is even more widely distributed there (Britton & Brown: "Nova Scotia and N.W. Territories south to Florida and Texas").

(2) Aquilegia is already before the Senate as a possible national flower for the United States. Its claims have already been presented in the press.

(3) One species, coerulea, has already been chosen by Colorado, and our adoption of Aquilegia would put our Dominion on a par with a single state.

(4) Canadian forms do not show either the variety of colour, or length of spur so conspicuous in American and European forms.

(5). However, Aquilegia is easily propagated and grows readily under ordinary conditions. It is also very well known.

II. *Aster.*—No one species is characteristic of Canada nor yet of any province. It might readily run wild and become a noxious weed wherever introduced.

III.—*Iris.*—The Iris or Fleur-de-lis is the national flower of France, and even appears on the coat of arms of Quebec. It is thus preempted.

IV.—*Trillium (grandiflorum).*—Occurs in greatest abundance in Ontario and Western Quebec. Would be a natural choice for the provincial flower for Ontario. However, it dies down in summer if planted in the sun and the flowers have poor lasting qualities.

V.—*Larkspur.*—Not a distinctive flower of Canada.

VI.—*Pæony.*—Already chosen as a national flower by China.

THE TORONTO LIST

I. *Aquilegia.*—Given in the Ottawa list.

II.—*Cornus canadensis.*—Bunchberry or Dwarf Cornel.—Characteristic of Canadian woods across the breadth of the Dominion (Britton & Brown: "Newfoundland to Alaska and south). It is clean, clear-cut in appearance and readily adaptable to design. The flowering period is good and the fruit has a beauty of its own. Its inflorescence could be made symbolic of the confederation of provinces into the Dominion. The plant admits of easy propagation and is already established in cultivation on rockeries in Great Britain. A good choice for a national flower, but unfortunately at present not as widely known to the people as is desirable.

III. *Hepatica.*—Wide in distribution but characteristically eastern, not west beyond Manitoba. Known also in Europe and Asia and in the Himalayas (*species falconeri*). No definite floral colour, purely a spring form with ephemeral flowers and leaves becoming distorted in summer. Easily propagated, however, and adaptable to design. Good for Ontario.

IV. *Trillium.*—Given in the Ottawa list.

THE TIGER LILY SUGGESTED

BY RICHARD H. McDONALD, WINNIPEG

I should recommend the committee in charge of the selection of a national flower for Canada to investigate the claims of the Tiger or Orange Red Lily (*Lilium Philadelphicum*). It is I believe a wild flower not met with in Europe at all. It also seems to be peculiar to this northern country. It is very general in some parts of Ontario, if not all, and one of the most common of the western flowers indigenous to the prairie. It is not a wood flower as is supposed, but flourishes best on sandy soil, in its wild state. There is no more splendid sight than miles of this flower in the months of July and August with its deep reddish orange flower standing up so bravely instead of being pendulous like the Canadian lily. Masses of this bloom on our soldiers' graves would certainly be most effective. It is very hardy and also has the advantage of not making big roots. It seems to me a characteristically Canadian flower which would improve by cultivation.

The outcome of the war is so dependent upon the food supply that it is not too much to say that upon the crop of 1918 the result very largely depends. This is not merely a farmer's problem, for he cannot increase production without labour. It is not wholly a problem for city or townsmen, for while they may do their best to assist, the farmer holds the key to the situation. It is the biggest job Ontario has ever been called upon to undertake, and the solution of the problem must rest equally in the hands of the farmer and townsman. Unless our men, women and children are willing to work together, forgetting largely the distinction of rural and urban, we shall fail to do our best. —*Circular to County Councils of Ontario.*

ASSOCIATIONS AND SOCIETIES

CANADIAN NATIONAL LIVE STOCK COUNCIL

A committee consisting of regularly appointed delegates of the Live Stock Record Associations in Canada met in Toronto on April 6th to deal with the matter of forming a Dominion-wide live stock council. This matter was fully discussed at the annual meetings of the Record Associations held during the winter, when the delegates were appointed. This Council, representing all the live stock associations and societies in Canada, with a combined membership of upwards of 25,000, will have authority to deal with railway companies, governments, and other organizations in matters pertaining to the commercial interests of the live stock industry valued at a billion dollars. The following resolutions were adopted:

1. That a National Live Stock Council be formed.
2. That it be named the Canada National Live Stock Council.
3. That it shall consist of eleven members composed of five representatives of the Western Canada Live Stock Union, three of the Eastern Canada Live Stock Union, and two of the Canadian National Live Stock Record Committee, with the Chairman of the Record Board as Chairman of the Council.

The Live Stock Record Committee was authorized to notify the secretaries of the Eastern Canada and Western Canada Live Stock Unions of the number of representatives to which they are entitled, and to ask them to appoint their members as early as practicable. In response to this notification the following were nominated as members of the first council:

Representing the Western Live Stock Union—F. H. Auld, Regina, Sask.; Andrew Graham, Pomeroy, Man.; Dr. J. G. Rutherford, Calgary, Alta.; J. L. Walter, Clive, Alta., and Dr. S. F. Tolmie, M.P., Victoria, B.C.

Representing the Eastern Live Stock Union—J. D. Brien, Ridgetown, Ont.; W. A. Dryden, Brooklyn, Ont., and Geo. Pepper, Toronto.

Representing the National Live Stock Record Committee—W. F. Stephen, Huntingdon, Que., and Robert Miller, Stouffville, Ont.

Chairman—Wm. Smith, M.P., Columbus, Ont.

The Record Committee was authorized to draft a provisional constitution and to carry on such other work as is necessary in completing the organization of the Council.

RECORD COMMITTEE OF THE NATIONAL RECORD BOARD

At the annual meeting of the Canadian National Live Stock Record Board, held in Toronto, on April 5th, 1918, the record committee of 1917 was re-elected as follows: Chairman, Wm. Smith, M.P., Columbus, Ont.; representing heavy horses, Peter White, K.C., Pembroke; light horses, Robert Ness, Howick, Que.; dairy cattle, W. F. Stephen, Huntingdon, Que.; beef cattle, Robert Miller, Stouffville; sheep, J. M. Gardhouse, Weston, Ont.; swine, J. E. Brethour, Burford, Ont.; secretary-treasurer, John W. Brant, Ottawa.

CANADIAN FLAX GROWERS' ASSOCIATION

The annual meeting of the Canadian Flax Growers' Association was held in London, Ont., on March 8. There was a large attendance; a number of representatives of the flax industry being present from the United States. A deputation was appointed to wait on the Ontario and Dominion Governments to urge the importance of the Canadian flax industry, especially in view of the fact that a large quantity of flax fibre is required for the manufacture of aeroplane wings. It was pointed out that the fibre and seed grown in Ontario last year for export amounted in value to $1,954,000. A resolution was passed requesting that expert labour engaged in the flax industry be exempt from military service. The officers elected were: President, Amos Tipling, Wingham, Ont.; first vice-president, A. L. McCready, St. Mary's, Ont; second vice-president, Samuel Barbour, Toronto; secretary, R. L. Defries, Toronto.

CANADIAN GOOD ROADS CONGRESS

The fifth Canadian Good Roads Congress will be held in Hamilton on May 7th to 10th. The programme will consist of addresses and discussions upon current problems dealing with road construction and improvement. An exhibition of road materials and machinery will be a feature of the congress. The secretary of the congress is Geo. A. McNamee, Montreal, Que.

AN ONTARIO DAIRY COUNCIL

A conference of representatives of dairying organizations in Ontario was held at the Ontario Agricultural College on April 4th and 5th. The conference was called by H. H. Dean, Professor of Dairy Husbandry. In opening the conference, Professor Dean explained that it was called for three purposes, to discuss—

1. The dairying situation in the province.

2. The advisability of forming a provincial-wide organization covering all phases of dairying.

3. To bring the dairymen of the province into closer touch with the Agricultural College.

There were about eighty delegates present, representing the milk producers and dealers and the manufacturers of cheese, butter, ice cream, powdered milk, condensed milk, etc. At the first session, a committee representing all the various interests was appointed to consider the advisability of forming a provincial-wide dairy association. On the following day the committee recommended:

"That a Provincial Dairy Committee be formed, composed of two members from each existing dairy association, or any dairy association which may be formed, and departmental representatives to be named by the Minister of Agriculture, for the purpose of making definite recommendations for creating a permanent provincial dairy council; and that the Minister of Agriculture of Ontario be requested to take action in accordance with this resolution at the earliest possible date."

PRINCE EDWARD ISLAND STOCK BREEDERS' ASSOCIATION

A re-organization meeting of the Stock Breeders' Association of Prince Edward Island was held at Charlottetown on April 2nd. A resolution was passed asking the Government to continue its usual grants to the provincial and county exhibitions, as it was felt that the withdrawal of such grants would have a serious effect on the Island's live stock industry. The officers elected were: President, W. W. Crosby; vice-president, W. M. Lee; secretary, W. J. Gibson, Charlottetown.

NEW BRUNSWICK FRUIT GROWERS' ASSOCIATION

The New Brunswick Fruit Growers' Association met in annual meeting at Fredericton on March 13, and elected these officers: Hon president, T. H. Estabrooks, St. John; president S. B. Hatheway, Kingsclear; vice-president, Frank Fawcett, Sackville; secretary-treasurer, A. G. Turney, Fredericton.

NEW BRUNSWICK FARMERS' AND DAIRYMEN'S ASSOCIATION

The officers elected at the annual meeting of the New Brunswick Farmers' and Dairymen's Association were: President, C. M. Anderson, Sackville; vice-president, J. A. Bernier, Edmundston; recording secretary, C. M. Shaw, Hartland; corresponding secretary, A. R. Wetmore, Clifton; treasurer, H. H. Smith, Hoyt.

Among the resolutions passed were the following: Regarding bulls running at large, requesting the provincial Government to introduce a law prohibiting this running at large on the public highways in any part of the province; recommending that a larger measure of instruction be given in the public schools of the province relative to local conditions and activities in the country regarding agricultural pursuits; requesting that the Government guarantee that the price received for pork by the farmers, for the next two years, shall not be less than 20c per lb.; petitioning that the restriction against oleomargarine be reimposed immediately at the close of the war; opposing the daylight saving law; calling upon the Food Controller to insist upon millers abandoning the practice of forcing flour upon the people by refusing to sell feed without a quantity of flour in each car; approving a resolution from the parish of Moncton recommending an amendment to the Act for the Protection of Sheep, so that all dogs not included under the present Act be placed in the existing taxation clause, and be securely confined or tied from sundown to sunrise; approving of the appointment of Mr. W. R. Reek as Secretary for Agriculture, and pledging the farmers of New Brunswick to co-operate with the Department of Agriculture in the policy of encouraging increased production.

QUEBEC DAIRYMEN'S ASSOCIATION

At the annual convention of the Dairymen's Association of the province of Quebec, the following resolutions suggesting amendments to the Dairy Products Act were passed, and the Quebec Department of Agriculture was requested to take these resolutions into serious consideration, and to have such amendments adopted as circumstances justified:—

1. (a) That a regulation be adopted compelling all cheese and butter factories in the province to brand their products before shipping with a brand supplied by the Department of Agriculture.

(b) That such brand include the number of the division and the number of the factory.

(c) That makers refusing to observe this regulation have their license or diploma cancelled, as no control can be kept by the inspectors over the products of such makers.

2. That milk be paid for at the factories according to the percentage of fat, as is already done as regards cream.

3. That the grading of butter and cheese remain compulsory and general after the war, as it is now.

4. That makers be legally authorized to charge a higher and uniform rate for the making of cheese and butter, in order to prevent ruinous competition, and to enable them to have good curing rooms and to make such other improvements as are necessary to improve the quality of dairy products.

5. That pasteurizing cream for the making of butter be made compulsory.

Mr. Gustave Boyer, M.P., was re-elected president, and Mr. O. E. Dalaire, St. Hyacinthe, secretary.

QUEBEC SOCIETY FOR THE PROTECTION OF PLANTS

The annual meeting of the Quebec Society for the Protection of Plants was held at Macdonald College on March 21st. A committee was appointed to draw up a spray calendar to be distributed among the farmers of the province. Professor Lochhead was re-elected president; Rev. Father Leopold of Oka, vice-president; and Professor J. M. Swaine, Macdonald College, secretary.

CHAMPLAIN COUNTY AGRICULTURAL ASSOCIATION

At a meeting of the Champlain Agricultural Association, recently held at St. Stanislas, the following officers were elected for the year 1918: President, Dr. B. Bordeleau, M.P.P., Ste. Thècle; vice-president, Sadoth Tessier, Ste. Anne; agriculturist, J. A. Fortin, St. Stanislas; secretary-treasurer, J. T. Jacob, St. Stanislas.

The following programme was adopted and submitted to the Provincial Council of Agriculture for approval:

1. In order to meet the needs of the members of the different parishes of the county, a second light draft stallion will be purchased, of a breed to be selected at another meeting of the Board.

2. The following competitions will be arranged:

(a) A standing crop competition for fields of at least three acres.

(b) A clover seed growing competition out of the second cutting of clover.

(c) A good farm competition, in parishes where there are members of the association, as required by article 93 of the regulations of the Council of Agriculture of the province.

3. An exhibition of agricultural and industrial products, live stock, domestic products and works of art, will be held in the fall at a date to be selected later by the board of directors.

A seed grain fair was held recently by the association. Although the crops were poor last season, there were about 50 exhibitors and 150 exhibits of grain and seed grain, consisting of wheat, oats, peas, beans, buckwheat, flax, clover, potatoes, corn, etc.

HOWICK-HUNTINGDON AYRSHIRE CLUB

At the annual meeting of the Howick-Huntingdon Ayrshire Club held at Ormstown, Que., it was decided to have a consignment sale of Ayrshires in the spring of 1919, and to hold a free gift sale of live stock at an early date, the proceeds to be divided between the Red Cross and Patriotic funds. The officers, all of whom were re-elected, are as follows: President, Jas. Bryson, Brysonville, Que.; vice-president, R. R. Ness, Howick, Que., secretary-treasurer, Gilbert McMillan, Huntingdon, Que.

BELGIAN DRAFT HORSE BREEDERS' ASSOCIATION

At a meeting of the Belgian Draft Horse Breeders' Association, held at the Parliament Buildings, Quebec, on March 21, resolutions were passed approving the formation of a central association at Ottawa for advancement of the interests of Canadian Breeders' associations, and requesting the railroad companies to establish special rates for the transportation of pure-bred horses.

A proposition to create a Canadian strain of Belgian horses was also discussed and approved. It was decided to ask the Government to make registration compulsory for all Belgian horses.

The following officers were elected: President, M. Paul Tourigny; vice-president, De J. D. Duchesne; secretary-treasurer, M. J. A. Paquet, M.P.P., Quebec.

Mr. H. A. Martinette, was re-elected inspector for the association.

THE OTTAWA AGRICULTURAL CLUB

The annual dinner of the Ottawa Valley Agricultural Alumni Association was held in Ottawa on March 15th. The guest of the association was the Honourable T. A. Crerar, Minister of Agriculture, who gave an address. This organization began in 1911, and was, for a number of years, confined to ex-students of the Ontario Agricultural College located in the vicinity of Ottawa. Later it was broadened to take in ex-students of Macdonald College. At the meeting just held the membership was extended by the following resolution, which was passed unanimously: ' That the name of the organization 'Ottawa Agricultural Alumni Association' be changed to 'Ottawa Agricultural Club', and that it include as eligible for membership all those in the vicinity of Ottawa whose chief business is the advancement of Canadian agriculture". The officers, nominated to represent the chief branches of the Federal Department of Agriculture and local kindred organizations, were as follows: Hon. President, Dr. Jas. Mills, ex-president of the Ontario Agricultural College: president, W. J. Black, Commissioner under THE AGRICULTURAL INSTRUCTION ACT; first vice-president, E. D. Eddy, Chief Seed Inspector; 2nd vice-president, Geo. H. Barr, Chief of the Dairy Division; secretary-treasurer, P. E. Light, Markets Intelligence Division, Live Stock Branch; ex-officio, T. G. Raynor, Seed Inspector, Seed Branch; committee, Geo. Rothwell, Assistant Animal Husbandman, Experimental Farms; F. C. Nunnick, Agriculturist, Commission of Conservation; Dr. C. G. Hewitt, Dominion Entomologist; J. B. Spencer, Editor & Chief, Publications Branch; C. S. McGillivray, Inspector of Canneries, Health of Animals Branch; F. H. Grindley, Assistant Fruit Commissioner; W. D. Jackson, Agricultural Representative, Ontario Department of Agriculture.

ALBERTA PROVINCIAL CATTLE BREEDERS' ASSOCIATION

The annual meeting of the Alberta Provincial Cattle Breeders' Association was held at Edmonton on March 7th, when the following officers were elected: Honorary President, W. F. Stevens, Live Stock Commissioner; president, Angus McDonell, St. Albert; vice-president, W. H. Wallace, Viking; secretary, W. J. Stark, Edmonton.

ALBERTA CATTLE BREEDERS' ANNUAL SALE OF BULLS

The 18th annual auction sale of registered bulls under the auspices of the Alberta Cattle Breeders' Association was held at Calgary, on March 26th to 29th. A total of 856 animals was entered for the sale and 809 offered, of which 792 were sold. The number of contributors was 247, and the number of carloads shipped to the sale 131. Bulls were shipped from 85 stations, and 44 head were lead in from the Calgary district. A table of the receipts this year and last year follows:

	1918			1917		
	No.	Value	Average	No.	Value	Average
Aberdeen-Angus	70	20,795	$297.07	38	$11,540	$303.68
Galloways	3	525	175.00	6	1,105	184.16
Herefords	235	80,715	343.46	157	57,520	366.37
Red Polled	2	425	212.50	1	245	245.00
Shorthorns	387	90,665	234.28	267	66,411	248.73
	697	193,125	277.08	469	136,821	

The above receipts are for bulls one year old and over.

A statement regarding bulls under one year sold at the 1918 sale follows. No bulls under one year old were sold at any sales held previously:

	No.	Value.	Average.
Aberdeen-Angus.....	9	1,685	187.22
Herefords.....	21	6,680	318.10
Shorthorns.....	65	10,885	167.47
Total.....	95	19,250	202.63

Grand total—792 sold for $212,375, average $268.28.

The highest prices reached for each breed were: Aberdeen-Angus $1,250; Herefords $3,200; Shorthorns $1.075. In every case, the highest priced animal was the champion prize winner of the breed.

The bulls were sold to 519 purchasers, and 111 cars went to Alberta points, 4 to British Columbia, 8 to Saskatchewan, and one to Montana. The number of bulls sold to go out of the province was 74. The sellers purchased 63 bulls. The bulls were generally in better condition and of better quality than at previous sales. The Association has now sold 4,782 bulls for $801,875.00, and will hold its next sale of approximately 150 bulls at Lacombe on May 29th. For succeeding sales the secretary and managing director, taking his cue largely from suggestions made at the annual meeting of the Cattle Breeders' Association, recommends that bulls under one year shall not in future be accepted for sale; that judging shall be done in the forenoon, and the sale started at noon the same day, that bulls culled from the sale shall not be paraded in the ring, and that inferior animals be kept at home; that full pedigrees shall be given in the catalogue, and that prize winners shall be sold first and the other entries according to age.

THE ENCOURAGEMENT OF THE PROTECTION OF BIRDS

BY C. G. WATSON, SEC., McILWRAITH ORNITHOLOGICAL CLUB, LONDON, ONT.

While no bird-house competitions have been held in London, Ont., the Ornithological Club has encouraged the placing of nesting boxes about private grounds, and a great many such boxes are to be seen throughout the city. The city some years ago placed a number in Victoria Park, and these, with Springbank, a large national park of about 240 acres, and the Forest City's wealth of trees, offer very favourable nesting opportunities to our feathered friends.

We have been successful in having the Parks Commission erect signs throughout Springbank Park offering a reward of $50.00 for the conviction of anyone shooting or molesting wild life in any way there.

We also secured permission to erect feeding boxes for the birds at Springbank during the past winter, and had eight of these in operation quite successfully, purple finches, goldfinches, etc., spending the winter in unusually large numbers.

Our president, as one of the science teachers at the Collegiate Institute, has done a good deal in the way of encouraging field work amongst the pupils, building of wren boxes, etc.

PROVINCE OF QUEBEC SOCIETY FOR THE PROTECTION OF BIRDS

BY MRS. W. E. L. DYER, SECRETARY, MONTREAL

During the winter we acquired permission to put up bird houses on Mount Royal Park—the various city parks—the crown of Westmount Mountains (owned by McGill University), and the two cemeteries, Protestant and Catholic.

The authorities of these corporations were pleased to meet our wishes in regard to these natural bird sanctuaries, provided the bird-houses would be approved by them in general outlines, and put up under supervision.

The various schools in the city are being interested in the making of these boxes and prizes are being offered for the best results—the boxes are then, to be donated to the society for use in the parks.

The boxes made in Westmount schools will be placed on Westmount Mountains, as it is desired that each individual boy should have a proprietary interest in his own box, and know its location, and, if at all possible, assist in its erection.

The Boy Foresters have been making bird boxes for some years. Their co-operation is secured in the interests of these bird reserves, and the society offered prizes for the bird-houses made by them shown at their annual Hobby Show on April 14th.

The returned soldiers are also making bird houses for this society in connection with their sloyd and carpentering work in the Technical School.

It is hoped from these various sources to get enough boxes to create a good start

in the work of tempting the birds back to our city parks.

The society has gotten out, for the use of schools and others, approved information with dimensions and cuts of the most used bird-houses.

This society was started January 11th, 1917, and has already about 1,000 junior members, who have signed the society's pledge to protect wild life and who wear the society's button. Educational lectures are held monthly for the purpose of educating the public on the great economic benefit of birds as well as for purely æsthetic reasons. During the past year the society has had the honour of having as lecturers—Dr. C. Gordon Hewitt, Dominion Consulting Zoologist; Dr. D. N. Hamilton of Macdonald College; Prof. Arthur Willey of McGill University, and Miss Louise Murphy of Montreal.

A pamphlet, outlining the society's aims and of general interest to bird protectionists and bird lovers is in course of preparation for distribution. The society meets monthly in the Windsor Hotel, Montreal, and is anxious to co-operate in every way possible to secure attention to this most important economic benefit—the protection of our vanishing wild life.

NEW PUBLICATIONS

THE DOMINION DEPARTMENT OF AGRICULTURE

THE ENTOMOLOGICAL BRANCH

Root Maggots and Their Control and *How to Control Locusts or Grasshoppers* are the titles of Crop Protection leaflets No. 4 and 6 issued by the Entomological Branch. Mr. Arthur Gibson, Chief Assistant Entomologist, in charge of Field Crop Investigations, is sole author of the first named leaflet and joint author with Mr. Norman Criddle, Field Officer for Manitoba, of the second. Each leaflet describes the nature and habits of the pests and then details the methods of control.

THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

NOVA SCOTIA

Two Important Vegetable Pests, by W. H. Brittain, Provincial Entomologist. This is an eight-page circular describing the Potato Stem Borer (*Gortyna micacea* Esp.) and the Zebra Caterpillar (*Ceramica picta* Harr), giving the methods of control and illustrating the habits of the pests.

QUEBEC

The report of the provincial Minister of Agriculture on the "Competition of Agricultural Merit, 1917", being the twenty-eighth successive year, makes a book of 129 pages. Not only are full particulars of winners in the competition given and of their prize holdings, but, in nearly every instance, illustrations accompany the details.

ONTARIO

The More Important Fungus and Bacterial Diseases of Vegetables in Ontario, by J. E. Howitt, Professor of Botany, and D. H. Jones, Professor of Bacteriology. The object of this bulletin is to furnish all who are interested in the growing of vegetables with information which will enable them to identify the more common fungus and bacterial diseases of vegetables, and to apply intelligently the treatments which experience has proven to be the most effective in each case.

Wheat and Rye, by C. A. Zavitz, B.S.A., D.Sc., Professor of Field Husbandry and Director of Field Experiments. This is Bulletin No. 261 of the Ontario Agricultural College, and is a complete exposition of both cereals, but especially of wheat, to which 25 of the 30 pages of which the bulletin consists are devoted. The history of wheat and its botanical classification are first dealt with and then sections are devoted to comprehensive treatises on both winter and spring wheat. Five pages are devoted to particulars regarding rye. The explanation is made that the bulletin is submitted to the farmers of Ontario with the expectation that it will prove of real service in increasing the production of essential food materials. Illustrations and tabulated information add to the value of the bulletin.

Spring Wheat, Circular No. 7, by Dr. C. A. Zavitz, Professor of Field Husbandry, Ontario Agricultural College. This is a four-page leaflet giving in summary form much of the matter in Bulletin No. 261, previously noticed, and explaining how and where spring wheat for sowing can be obtained from 50,000 bushels, purchased by the Ontario Department of Agriculture through the Federal Seed Commissioner, at the set price of $2.74 per bushel.

Back-yard Pig Feeding, Circular No. 8, by H. M. King, B.S.A., Associate Professor of Animal Husbandry, Ontario Agricultural College. A second line to the title says back-yard pig feeding is practicable

and profitable in cities, towns and villages. Seven good reasons are given for keeping and feeding a pig, followed by instructions on how best to do so. Advice is also given on arranging the pen and building the house or shed.

Results of Co-operative Experiments with Farm Crops, Sources of Seed and Production of Food Materials: Bulletin 260, Ontario Agricultural College. This is an advance bulletin containing a partial report of the annual meeting of the Experimental Union at the College in January, 1918. Under the four headings,"Results of Co-Operative Experiments in Agriculture", "Sources of Farm Seed Supply for the Province of Ontario", "Root Seed Growing in Canada", and "Practical Suggestions in the Production of Food Materials for the Coming Year", a vast deal of information, contributed by leading authorities on the different subjects, is given in the 56 pages of which the bulletin consists.

MANITOBA

Extension Bulletin No. 22, Asparagus. Part I—Asparagus Culture by J. A. Neilson, B.S.A., Lecturer in Horticulture. Part II—Preparation and Use of Asparagus—by Miss E. M. Eadie, Professor of Household Science.

Our Friends—The Birds is the title of Extension Bulletin No. 23. Many facts are given by Professor E. W. Jackson, Manitoba Agricultural College, regarding birds in their relation to agriculture, especially relative to their value and their food. Some details are also given of the seed-eaters. Illustrations add materially to the interest and value of the bulletin.

BRITISH COLUMBIA

A Directory of Poultry-Breeders in British Columbia has been published as Bulletin No. 7 of the Provincial Poultry Association.

MISCELLANEOUS

A Hand Book for Farmers. Messrs. F. C. Nunnick, B.S.A., Agriculturist, Commission of Conservation, and E. P. Bradt, B.S.A., Agricultural Representative for Dundas County, have collaborated in a hand book for farmers. It contains valuable details about tillage, manures, variety and seed selection, clover and clover seed production, weeds, insect pests, and plant diseases, and miscellaneous farm activities. The hand book is published under the auspices of the Commission of Conservation.

NOTES

For the year 1918 the Department of Agriculture of Prince Edward Island has cancelled all agriculturel exhibitions.

The directors of classical colleges, at a meeting held in Quebec city at the end of April, decided to close the colleges for three months during the busy season to enable the pupils to devote their time to farm work and thus materially assist in increasing production.

Mr. H. Higginbotham has been appointed to succeed Mr. P. P. Woodbridge as secretary of the United Farmers of Alberta. Mr. Higginbotham for the past three years has been a member of the staff of *The Grain Growers' Guide,* published at Winnipeg.

The merchants and business men of Huntsville, in the Muskoka and Parry Sound district of Ontario, have decided to close the stores one day a week during seeding and harvest seasons, in order to allow merchants, office men, and clerks to assist the farmers, or work in their own gardens. This plan has been brought about by consultations between Mr. F. C. Patterson, Agricultural Representative, and the business men of the town.

Mr. A. H. MacLennan, B.S.A., a member of the staff of the Department of Horticulture of the Ontario Agricultural College, has been transferred to the Horticultural Division of the Department of Agriculture at Toronto as vegetable specialist. Mr. MacLennan succeeds Mr. S. C. Johnston, who now occupies the position of director of the Motion Picture Bureau of the Ontario Government.

In the administration of the Contagious Disease of Animals Act, it was necessary recently to fine a man in Alberta for violating the regulations governing mange in cattle. This individual moved a number of cattle which were suspected of being affected with the disease. Prosecution proceedings were taken against him and he was fined $75.00 and costs.

There are 136 agricultural societies in New Brunswick with an average membership of a little better than 62 each, or 8,505 in all. Ten new societies were organized in 1917. The amount received in membership fees totalled $11,225.58, and the grants to the societies from the Provincial Government and under THE AGRICULTURAL INSTRUCTION ACT of the Dominion aggregated $18,000.

Mr. G. A. Williams, Agricultural Representative, Durham County, Ontario, has worked out a scheme for equalizing the contributious for prizes in school fairs and home garden contests. This provides that schools with an enrolment during the months of January and February of less than twelve pupils should contribute $3.00; between twelve and twenty pupils, $5.00; and over twenty, $7.00. These figures are the result of calculations based on prizes won by schools in the county during the past two years.

At the annual meeting of the Montreal Milk Producers' Association, which has a membership of 320, the price of milk for the season of 1918 was fixed at 30c per gallon for May, June, July, and August, and 32c for September, delivered in Montreal. Cream prices were fixed at 60c per pound of butter fat for the first four months of the summer season, and 65c for September. As the area covered by the Association is becoming extensive, it was decided to organize branch associations where there were 20 or more milk or cream producers.

Mr. S. E. Greenway, Director of Agricultural Extension in the province of Saskatchewan, has been advised by the secretaries of more than a score agricultural societies that they will hold ploughing matches during the coming summer. Some of the societies intimated that they will hold several matches within their respective districts. At these meetings the ploughing is done early in the day and the awards made and the remainder of the day is given up to sports and social intercourse. The director is endeavouring to learn of all the ploughing matches that are to be held in the province with a view to working out satisfactory circuits.

The Secretary of the Board of Trade of Sherbrooke, Quebec, has advised THE AGRICULTURAL GAZETTE that a strong campaign is being conducted in that city to have large quantities of food produced on the vacant lands within the city limits. Committees have been put in charge of securing and allotting areas, fertilizing, cultivation, the supplying of seed, supervision, publicity, and the giving of prizes for competition. Organizations such as Boy Scouts, Daughters of the Empire, clubs, and lodges, are undertaking the cultivation of certain tracts of land. The plots will be turned over to the gardeners all ready for seeding. The actual cost of this preparation is being charged to the lot-holders.

Mr. G. R. Green, Agricultural Representative in Oxford County, Ontario, reports that the Woodstock farmers' club transacted business to the extend of $13,000 in twelve months. Encouraged by its success, the club has reorganized and has applied for a charter. Capital is to be raised on the demand note system of $100 for each member.

Mr. M. C. Herner, Professor of Poultry Husbandry at the Manitoba Agricultural College, has pointed out that the note that appeared on page 309 of the March issue concerning him might give a wrong impression. Professor Herner assisted Professor Baker, Head of the Poultry Department of the Saskatoon University, in a poultry section of the live stock and seed grain short course held at the College of Agriculture at Saskatoon. A full day was given to poultry work, Professor Herner giving assistance to Professor Baker in carrying it out.

At a recent publicity meeting of the Montreal Publicity Association, a plan to increase the production of pork was discussed. Acting on a request from the Food Controller, the Association has appointed a committee of three members to study the means of producing pork on a large scale. This committee is composed of Messrs. Eugene Tarte, L. A. Holland, and G. Warren Brown. The committee decided to purchase one hundred and fifty young pigs, which are to be fed on a farm at Dorval, and subsequently turned into pork, ham, and bacon. A manager of an important local bank, and several business men, have promised financial help. The profits, if any, will be divided among the members contributing.

At a conference of the Joint Committee of Commerce and Agriculture attended by fifty leading representatives of business financial, and agricultural interests, held in Regina, Saskatchewan, on March 13 and 14, the following telegram was read from George W. Allan, M.P. for South Winnipeg, who took an active part in the organization of the committee: "Sane thinking at a time of peace gave birth to co-operation between agriculture and commerce in the West through Joint Committee. Patriotism under war conditions will cement this union, intensify its usefulness, and enlarge the scope of its operations. The Joint Committee must carry on and do its bit. We in the West have got together, and the West and the East must get together and play the game."

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The Canadian Horticulturist and Bee-keeper, Toronto, Ont., March, 1918.
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Importance of the Corn Crop in Ontario Agriculture, P. L. Faucher, Corn Specialist, Ontario Department of Agriculture, page 441.

The Saturday Press and Prairie Farm, March 30, 1918.
The Problem of Crop Production. An Address delivered by Professor Bracken before the Short Course Students in Crop Production at the University of Saskatchewan, page 12.

The Canadian Thresherman and Farmer, Winnipeg, March, 1918.
Farm Flocks in War-Time, M. C. Herner, Professor of Poultry Husbandry, Manitoba Agricultural College, Winnipeg, page 40B.

Farm and Ranch Review, Calgary, Alta., March 5, 1918.
Why Breed Shorthorns? G. E. Day, Secretary-Treasurer, Dominion Shorthorn Breeders' Association, page 222.
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Farm and Dairy and Rural Home, Toronto, March 28, 1918.
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Mar. 28—Swine Feeding Experiments at Lacombe, G. H. Hutton, B.S.A., Superintendent Lacombe Experimental Farm, page 525.

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Mar. 27—New Grasses and Clovers, T. J. Harrison, Professor of Field Husbandry, Manitoba Agricultural College, page 495.

The Grain Growers' Guide, Winnipeg, Man., April 3, 1918.
A World's Fair for Farmers, Professor T. J. Harrison, Manitoba Agricultural College, page 713.

The Journal of Agriculture and Horticulture, Quebec, April, 1918.
Feeding the Sow and Young Litter, E. S. Archibald, Dominion Experimental Farm, page 152.

The Maritime Farmer and Co-operative Dairyman, Sussex, N.B., March 5, 1918.
Bee-keeping and Honey Production in New Brunswick, L. T. Floyd, Provincial Apiarist, page 310.
Mar. 19—The Need for Greater Home Garden Production, A. G. Turney, Provincial Horticulturist, New Brunswick, page 346.

The Nor-West Farmer, Winnipeg, Man., April 5, 1918.
Spring Work on the Land in Manitoba, W. C. McKillican, Brandon Experimental Farm, page 435.

PART V

The International Institute of Agriculture

T. K. Doherty, LL.B., Commissioner

FOREIGN AGRICULTURAL INTELLIGENCE

All communications in regard to this section should be addressed to T. K. Doherty International Institute Commissioner, Department of Agriculture, West Block, Ottawa.

SCIENCE AND PRACTICE OF AGRICULTURE

GENERAL INFORMATION

988—**Are Anopheles of Non-Marshy Districts Capable of Transmitting Malaria?**—ROUBAUD, E., in *Comptes Rendus des Séances de l'Académie des Sciences*, Vol. 165, No. 12, pp. 401-403. Paris, September 17, 1917.

In spite of the continuous presence of *Anopheles maculipennis* in certain reclaimed districts of France, such as the Dombes, Sologne, etc., which were previously marshy, malaria has not reappeared to any marked extent. This fact has given rise to the supposition that the extinction of the disease may be connected with a sort of natural immunity of the mosquitoes concerned. Grassi, Schaudinn, and other workers admit the existence of species of mosquitoes naturally immune to malarial infection, which appear to have played an important part in the gradual disappearance of the endemic. It has even been suggested that good results might be obtained by the artificial distribution of these species as a malarial prophylactic.

At the Pasteur Institute at Paris patients under treatment for malaria were bitten by perfectly healthy Anopheles taken in the town, and it was proved that these mosquitoes were thus infected. The experiments were carried out with: 1) *Plasmodium vivax* Gr. and Fel. or var. *tertiana* Lav. (benign-tertian); 2) *Pl. praecox* Gr. and Fel. or var. *parva* Lav. (malignant-tertian).

The author, who was perfectly healthy, allowed himself to be bitten by one of the infected mosquitoes on the 28th August. On the 13th September the fever appeared, preceded a few days previously by exhaustion; the sporazoites (*Plasmodium vivax*) were located in his blood on the 14th September.

It is seen, therefore, that *Anopheles maculipennis* of the Parisian, non-marshy district, is perfectly capable of transmitting malaria, and is in no wise an immune species. It is, indeed, highly improbable that any such species exists.

CROPS AND CULTIVATION

991—**Investigations into Soil Efflorescences in Germany.**—PUCHNER, H., in *Kolloid-Zeitschrift*, Vol. XX, pt. 5, pp. 209-238. Dresden, May, 1917.

992—**The Absorption of Cations and Anions by Soil.**—DE DOMINICIS, A., MAMMANO, G., and DIAFERIA, L., in *Annali della Regia Scuola Superiore di Agricoltura in Portici*, 2nd Series, Vol. XIII, p. 26. Portici, 1916. (2 pp. in Institute Bulletin).

993—**The Humus Content of the Soil as a Guide to Fertility.**—CARR, R. H., in *Soil Science*, Vol. III, No. 6, pp. 515-524, Bibliography of 16 publications. New Brunswick, June, 1917.

994—**Ammonia—Fixation in Semi-Arid Soils: Researches in the United States.**

MACBETH, J. G., in the *Journal of Agricultural Research*, Vol. IX, No. 5, pp. 141-155. Washington, 1917.

995—**Influence of Crop, Season and Water on the Bacterial Activities of the Soil; Experiments Made in Utah, U.S.A.**—GREAVES, J. E., STEWART, R., and HIRST, C. T., in *Journal of Agricultural Research*, Vol. IX, No. 9, pp. 293-341. Bibliography of 66 publications. Washington, D.C., 1917.

It is of the utmost importance that the quality and quantity of plant food rendered available during the season should nicely balance that required by the growing plant, for then we have the maximum yield with the minimum loss of soil fertility. Most of the changes which take place in the soil constituents are caused by micro-organisms; the speed with which these transformations take place within a soil is governed, amongst other factors, by the season of the year, the crop, and the water which the soil receives.

The writer carefully examines the literature dealing with the subject, and sets forth the results of his experiments carried out on soil of a sedimentary nature. There were 5 series of 4 plots; one series was fallow, while the others were under lucerne, maize, potatoes and oats respectively. In each of the 5 series, one plot was not irrigated, while the others received a minimum (15 inches), average (25 inches), and maximum (37.5 inches) amount of water, which was applied 5 times in equal quantities. The plots were sampled during the spring (about the middle of April), mid summer (about the end of July), and in the autumn (about October 31 or November 1). The samples were analysed for moisture, nitric nitrogen, number of bacteria developing on synthetic media, and the ammonifying and nitrifying powers.

It was found that during spring and summer the nitric nitrogen is about uniformly distributed throughout the first 6 ft; in soil under lucerne the amount remains relatively small during the different seasons, but is a little larger in autumn than in spring. In this layer the *absolute* amount of nitrates increases with the quantity of water supplied. On the other hand, the *relative* quantity of nitrates, that is to say, the amount bearing a relationship to the water supplied, is greatest where only 15 inches of water are given. In the upper layer of the fallow plot and of those under potatoes, oats, and maize respectively, the relationship of nitrate formation to water-supply is exactly the same as in the case of the lucerne plots.

Large quantities of nitric nitrogen disappeared from the fallow soil during the summer months. This is attributed to the growth of bacteria which transform it into protein substances, and not to denitrification.

The larger applications of water carry much of the nitric nitrogen beyond the sphere of action of the plant, and this accounts for the decrease in crop yield, which is often noted when excessive quantities of irrigation water are applied to the soil.

The application of water to a soil depresses the number of organisms which will develop on synthetic agar in lucerne, oats, and potato soil, but increases them in fallow. The results obtained with maize are irregular. The ammonifying power of all the soils, except the lucerne, was increased by irrigation. Water increased the nitrifying powers of all the soils, except the oat soil. There was a difference of 2° F., in the temperature of the irrigated and non-irrigated soils. This difference in temperature was perceptible to a depth of 4 ft.

The number of organisms is higher in the cropped than in the fallow plots, and this is probably due to the residues left upon the cropped soil.

Naming the soils in order of increasing ammonifying power, we have: lucerne, oats, maize, potato and fallow. By naming them in the order of increasing nitrifying power, they are: fallow, maize, oats, lucerne and potato. The lucerne not only feeds closer upon the nitric nitrogen of the soil than do other crops, but it also increases the nitrifying power of the soil. Hence it would deplete the soil of its nitrogen more rapidly where the entire crop is removed than would other crops.

The use of irrigation water, by increasing the bacterial activities of the soil, renders the nitrogen soluble, and where excessive quantities of water are used, much of the nitrogen is washed from the soil, thus unnecessarily depleting the soil of its nitrogen. This in turn gives diminished crop-yields.

996—**Methods for Determining the Reaction of the Soil; Investigations in Denmark.**—CHRISTENSEN, H. R., in *Tidskrift for Planteavl*, Vol. 23, pp. 1-83. Bibliography of 33 publications. Copenhagen, 1916. (3 pp. in Institute Bulletin).

997—**The Quantitative Estimation of Calcium Carbonate in Determining the Nature of Soils.**—PASSERINI, N., in *Bullettino della Societa Botanica Italiana*, Nos. 4-5, pp. 50-52. Florence, April-May, 1917.

999—**The Construction of Reservoir Dams in France.**—LEVY-SALVADOR, PAUL, in *La Nature*, No. 2295, pp. 177-182. Paris, September 22, 1917. (2 pp. in Institute Bulletin).

In the central massif range of France there is a fair number of stone reservoir-dams, all built of hydraulic lime mortar.

The perfect state of preservation of some of them after fifty years shows what excellent results may be obtained by this method of construction. Although many of the dams recently built in France and abroad, especially in the United States, are made of other material, such as steel, reinforced concrete, or cement, stonework still seems to offer the greatest guarantee of safety for works the rupture of which would entail disastrous consequences. It is only this question which the author studies, explaining the principles to be observed in making a reservoir-dam. As an example the Cher dam is taken. This dam, about 9 miles from Montluçon, is 154 feet high and holds 1060 million cubic feet of water with only 529,640 cubic feet of stone work.

A description of the building of the Cher dam, begun in July 1906, and finished during 1909, is given and may serve as an example for the construction of stone dams.

1000—**Blasting Ditches.**—MURDOCK, H. E., in *Montana Agricultural College Experiment Station, Circular* No. 55, pp. 63. Bozeman, Montana, February, 1916.

The circular describes the blasting of drainage ditches on the Bozeman Experiment Station farm between the years 1913 and 1915, and gives practical details of the work.

It is particularly in gravelly and rocky soil that ditching is difficult and that blasting may be carried out to advantage.

Preparatory to starting the work all the brushwood is cleared off. Holes are then dug 22 inches apart. Experience showed this distance to be the most satisfactory; if it be less there is unnecessary waste of explosive, if more some of the charges misfire. Two sticks of 60% Hercules dynamite are placed in each hole, which are dug by steel bars 2½ feet long, driven in the earth to within 4 or 6 inches of the surface, and withdrawn either by hand or machine.

To prevent the holes from caving in, tubes made of one inch galvanised iron pipe are inserted and the charge passed in through them. The pipes are then withdrawn. As the holes fill with water no further tamping is necessary. About 25 holes are exploded at once, the middle hole being used as the primer and joined to the others by a waterproof fuse. An electric detonator may be used.

Three men are necessary for the crew. The channel made by the explosion is 2 to 3 feet deep and 5 to 7 feet wide. After blasting, the channel is cleared out by hand. As dynamite freezes very easily, the work must be done at a suitable season.

The following comparative expenses of making open ditches were drawn up from the Station accounts:

Hand dug ditch		$3.35
Blasted ditch	hand labour, inexperienced	3.10
	hand labour, experienced	2.36

Blasting ditches by dynamite has proved both practical and economical under the conditions existing at the Station. No piles of dirt are left along the bank, thus ensuring a good flow of surface water. The figures illustrating the circular show that the ditches may be made very regular, and allow the comparison of work carried out by a ditching machine and that carried out by dynamite.

1002—**Experiments in Irrigated Crops in the United States.**—I. KNORR, F., Management of Irrigated Land, in *Bulletin of the Agricultural Experiment Station of Nebraska,* Vol. XXVII, Art. IX, *Bulletin* No. 152, 24 pp., 12 tables. Lincoln, Nebraska, June, 1915.—II. HARRIS, F. S., The Irrigation of Potatoes, in *Utah Agricultural Experiment Station, Bulletin* No. 157, 20 pp. Logan, Utah, June 1917. (2 pp. in Institute Bulletin).

1003—**Lime on the Farm in New South Wales, Australia.**—GUTHRIE, F. B., in *Department of Agriculture, New South Wales, Farmers' Bulletin* No. 115, pp. 31. Sydney, July, 1917.

Instructions of a monographic character upon the different uses of lime in practical agriculture.

After having set forth the advantages of liming, and the lime content of the South Wales soils, the writer considers the different forms in which lime is applied—Carbonate of lime—agricultural, or mild lime (containing about 82 per cent of lime); this is the name given locally to the stone-lime that has not been properly burnt—gas lime—residual lime from acetylene generators—spent lime from tanneries—wood ashes and plant ashes—gypsum—basic slag.

The residual lime from acetylene generators contains from 36.19 to 64.38 per cent of lime. It can be used in a fresh state, while gas lime must be exposed to the air for some time before being applied.

A sample of spent-lime from tanneries contained in addition to an appreciable amount of nitrogen and traces of phosphates and potash, 49.5% of calcium hydrate and 26.0% of calcium carbonate.

Among the Australian ashes analysed, the case of the ash of *Gidgea acacia*(?) is exceptional. This contains 95 per cent of pure calcium carbonate. Gypsum is of great value in neutralizing the carbonate of sodium which renders soil, or water, alkaline and caustic. The writer mentions an experiment in which the alkalinity of a water estimated at 35.28 grains of sodium carbonate per gallon was reduced to one half after 24 hours, and to 10.92 gr. in 6

days, after which the decrease was very gradual.

The writer gives the amount of lime to be used for liming and sets forth the bad effects of lack of lime in the soil, and of its excessive use or misuse. He then deals with the other uses of lime on the farm: in the formation of the compost heap—as a fungicide or insecticide, whether alone, or mixed with other compounds, or in the form of gypsum—for softening water whose hardness is due to the presence of calcium carbonate—for making whitewash—for waterproofing corn-sacks—for making artificial stone.

The writer concludes by expressing his hope that the present transport concessions for agricultural lime will be extended to all forms of lime used for agricultural purposes in Australia.

1004—**The Composition of Army Stable Manure.**—RUSSELL, E. J., (Rothamsted Experimental Station), in *The Journal of the Board of Agriculture*, Vol. XXIII, No. 11, pp. 1053-1055. London, 1917. (2 pp. in Institute Bulletin).

1005—**Value of Duck Manure**—*Mark Lane Express Agricultural Journal*, Vol. 117, No. 4469, p. 495. London, 1916.

1006—**A New Source of Potash in England.**—I. CRANFIELD, HAROLD T., A New Source of Potash, in *The Journal of the Board of Agriculture*, Vol. XXIV, No. 5, pp. 526-530.—II. Blast Furnace Dust, *Ibid.*, p. 182. (2 pp. in Institute Bulletin).

1007—**Production of Nitrates by the United States Government.**—I. Nitrate Supply Committee Recommendations on Synthetic Nitric Acid for the Government with Reports on Various Methods. *The Journal of Industrial and Engineering Chemistry*, Vol. 9, No. 9, pp. 829-841. Easton, Pa., September 1, 1917.—II. Production of Nitrates by the Government. *Science*, N. S., Vol. XLVI, No. 1185, pp. 250-258. Lancaster, Pa., September 14, 1917.

The United States War Department gives an account of its preparations for the production of nitrates in accordance with a report filed by the Nitrate Supply Committee.

The Nitrate Supply Committee, appointed by the U. S. Secretary of War, was under authority of a provision in the national defence act for an investigation "to determine the best, cheapest and most available means for the production of nitrates and other products for munitions of war and useful in the manufacture of fertilizers and other products."

The general recommendations, dated May 11, 1917, of the Nitrate Supply Committee are reported at length.

The Nitrate Supply Committee comprised U. S. Army and Navy officers, representatives of the Bureau of Soils, U. S. Department of Agriculture, of the Bureau of Standards, U. S. Department of Commerce and of the Bureau of Mines, Interior Department, as well as scientific men and engineers.

1008—**The Presence of Arsenic in Hops, in the United States.**—STOCKBERGER, W. W., and COLLINS, W. D., (Food-Investigation Chemist, Bureau of Chemistry), in *U. S. Dept. of Agriculture, Bulletin* No. 568, *Joint Contribution, from the Bureau of Chemistry and the Bureau of Plant Industry, Professional Paper*, 7 pp. Washington, D.C., August 8, 1917.

1009—**The Presence of Nitrites and Ammonia in Diseased Plants.**—I. BONCQUET, P. A., in *The Journal of the American Chemical Society*, Vol. XXXVIII, No. 11, pp. 2572-2576. Easton, Pa., November 1916.—II. BONCQUET, P. A., and BONCQUET, M., *Ibid.*, Vol. XXXIX, No. 9, pp. 2088-2093. Easton, Pa., September 1917. (2 pp. in Institute Bulletin).

1010—**Self-Sterility in Plants.**—MOORE C. W., in *The Journal of Heredity*, Vol. VIII, No. 5, pp. 203-207. Washington, May, 1917. (2 pp. in Institute Bulletin).

1011—**The Behaviour of the Hybrids Avena sativa patula var. Victor × Avena sativa nuda var. inermis.**—ZINN, JACOB, and SURFACE, M. FRANK, in *Journal of Agricultural Research*, Vol. X, No. 6, pp. 293-312. Washington, 1917. (2 pp. in Institute Bulletin).

1012—**Hybrids of Zea Ramosa and Zea tunicata; Experiments Carried out in the United States.**—COLLINS, G. N., in *Journal of Agricultural Research*, Vol. IX, No. 11, pp. 383-395. Bibliography of 9 Publications. 8 plates. Washington, June 1917. (3 pp. in Institute Bulletin).

1013—**The Colour of the Seed in the Descendants of a Natural Hybrid of Two Varieties of Phaseolus vulgaris, in Sweden.**—LUNDBERG, JOHN, and AKERMAN, A., in *Sveriges Utsadesforenings Tidskrift*, Year XXVII, Pt. 3, pp. 115-121. Malmo, 1917. (3 pp. in Institute Bulletin).

1015—**The Improvement of Native Vines by Crossing and Selection in the United States.**—DEARING, CHARLES, in the *Journal of Heredity*, Vol. VIII, No. 9, pp. 409-424. Washington, D.C., 1917. (3 pp. in Institute Bulletin).

1016—**Wheat Production in the Argentine.** —GIROLA, CARLOS D., in *El Cultivo des trigo en Argentina*, Publicacion des Museo Agricola, pp. 31. Buenos-Aires, 1917.

This pamphlet contains popular instructions for the use of farmers together with observations and data collected by the Author.

Wheat in Argentine covers an area of about 16 to 17¼ millions of acres. These are found exclusively in the co-called "grain district", which includes the provinces of Buenos Aires, Cordoba, Santa Fe, Entre-Rios, San Luis, and the National Pampa Territory. It could, however, be grown much more widely, for the soil of the Provinces of Mendoza, San Juan, La Rioga, Catamarca, etc., and the districts of Rio Negro, Nequen Chubut are well suited to it.

The varieties most commonly grown are:

BEARDED SOFT WHEATS: Barletta; Hungarian; Italian or Lombard; Russian; Rieti; Japanese; Saldomé; Piedmontese.

BEARDLESS SOFT WHEATS: Russian beardless; French or Bordeaux; Touzella.

HARD WHEATS: Candeal; Taganroch; and, much less, Medeah and "Espanol de grano duro."

Japanese wheat is remarkable for its adaptation to soils exhausted by repeated crops of cereals or other plants and by its resistance to drought, but its grain is small.

As a rule wheat is not manured in the Argentine. The average quantity of seed used is 62½ lbs. per acre; the average annual production in normal years is 12 cwt. per acre. The cost of production varies between 90 cts. and $1.12 per cwt.

The diseases to which wheat is most subject in the Argentine are: common rust or "polvillo del trigo" (*Puccinia graminis*); bunt (*Tilletia Tritici*) [*T. Caries*]. *T. Levis*); smut or "carbon" (*Ustilago Tritici*); straw blight or "mal del pie" (*Ophiobolus graminis*).

The insect pests are:—ants; locusts; "isoca comun" (*Leucania unipuncta*); "gusano blanco" (larvae of *Diloboderus abderus*); "palomita" or "alucita" (*Alucita cerealella* = *Sitotroga cerealella*); corn weevil or "gorgojo" (*Calandra granaria*); "gusano blanco" (*Trogosita mauritanica*), etc.

The figures included in the paper illustrate the best varieties of Argentine wheat and the machines generally used for the extensive cultivation of cereals.

1017—**Observations on Manitoba Wheat in Algeria in 1917.**—THE BROTHERS GAY, in *Bulletin Agricole de l'Algérie-Tunisie-Maroc*, 2nd. Series, Year 23, No. 9, pp. 181-182. Algiers, September, 1917.

(1) See also the original article: CARLOS GIROLA, *The Principal Varieties of Wheat grown in the Argentine Republic*, in Bulletin of Foreign Agricultural Intelligence November, 1915, page 849.

The following observations were made by the brothers Gay on the cultivation of Manitoba wheat at Berrouaghia (Algeria) in 1917.

Date of sowing: 3rd April, 1917; area sown: 15½ acres; quantity of grain sown: 1.045 lbs.; date of harvest: 27th July; yield of grain: 952 cwt.; weight per bushel: 63 lbs.

The wheat was broadcast in a very wet, clay loam, about 67 lbs. of grain per acre being used. The grain was neither very fine nor uniform.

In spite of very unfavourable climatic conditions (particularly violent and continuous sirocco during the flowering and ripening) the 1,045 lbs. of Manitoba wheat sown gave a yield of 952 cwt. of grain. This result is of great interest when compared with the yield of native wheat, and when account is taken of the lateness of sowing (the seed only reached Algiers on the 23rd March) in the Berrouaghia district, where the climate changes suddenly from very hot to very cold.

FORESTRY IN SWEDEN.—AMILON, J. A., in *International Review of the Science and Practice of Agriculture*, Year VIII, No. 11, pp. 1049-1061. Rome, November, 1917.

Without counting the lakes and watercourses, Sweden has an area of over 101-000,000 acres; about 12,000,000 acres are cultivated. The area of the wooded land of Sweden is 55,000,000 acres, or about 54% of the total area of the country. Of all the European countries, Finland alone has a greater proportion of wooded land. The proportion for the whole of Europe is 33%, for western Europe 25% only.

By reason of its differences in latitude and altitude Sweden includes many different vegetation zones determined by the various climatic conditions. The high mountain district, completely bare of forest, includes the northern part of the kingdom. It runs along the western frontier till it reaches, in the south, a latitude of about 62 degrees. To the east of this short district, and almost parallel with it, is that of the birch woods, which form a little band about 19 miles wide in the north, and rather narrower in the south. Below the birch region are the woods of coniferae. These may be divided into the northern and southern halves, separated by the northern limit of the oak. The greater part of this region is covered with scotch fir and spruce. Systematic forestry is now practised in the less accessible northern parts of the country, as well as in the southern parts which are better adapted to cultivation. Only in rare cases in the centre and north of Norrland are there still virgin forests in which hardly a tree has been felled.

At the end of 1914 the public forests of Sweden covered an area of 22,150,000

acres, not counting about 12,850,000 acres above the limit of coniferous trees which are not yet divided between the state and private holders. Forests, the income of which goes to the state, cover an area of 14,932,000 acres, the rest, 7,218,000 acres, being composed of public forests the working of which is either undertaken or controlled by the state, but the profits from which go to the communities, private owners, or endowed institutes.

The working of the public forests and state agricultural estates is directed by a central office—the Royal Estate Office, which controls both forestry and hunting. Since the beginning of 1916 this office has working under it 12 conservators, 118 rangers, 11 forestry engineers and 7 directors of forestry schools, all of whom take part in administration and control.

The private forests are by far the largest, most productive and best situated. In the centre and south of the country they belong to more or less large estates. In the forest districts of the north a large part of the forests is in the hands of societies engaged in the mining or timber industries.

The methods employed for the afforestation of lands which have been cleared or not planted for a long time, and for the improvement of natural regeneration, are very varied, but they might all be facilitated by the removal of the twigs, branches and crowns of trees left on the ground after clearing.

In order to do this, these remains are collected into heaps a yard high and a yard wide, or else into stacks, and, generally, burnt. Especially on land covered with a high, thick growth which threatens to choke the young plants, the remains are often set alight without being collected. In this case care must be taken to ascertain that, on the one hand, the twigs and branches are dry enough to burn, and, on the other hand, that the ground is not dry enough to suffer loss of humus through burning. For these reasons this operation is usually carried out at night in early spring.

In the snowy Norrland, and on pasture land, the remains from clearing are often left on the ground as they protect the plants from damage by snow as well as from the teeth and feet of animals. Some of the twigs are often spread over very dry and poor soils, thus not only decreasing evaporation, but, eventually, by their decomposition, contributing a considerable amount of food-elements.

Where self-sowing is relied on, the ground is prepared by hand or horse hoeing before the seeds fall. If self-sowing cannot be relied on the ground is artificially sown or planted.

Especially in the case of pines reproduction only succeeds with local seed, so that the cones are collected in the district. The Forest Administration, the Commission for the Preservation of Forests, and also private people, have erected establishments for extracting the seed from the cones collected, and many use the most recently perfected methods.

For planting seeds, holes are usually dug 6 x 6 inches to 12 x 12 inches square, and 2 to 3 inches deep, at regular intervals of 1 to 2 yards; the largest are made where vegetation is thick (heather), the smallest, where it is more sparse(heather and pines). In each hole are placed from 8 to 20 seeds, according to their quality and the favourable or unfavourable conditions at the time of germination and sprouting. Sometimes the holes are made of a long rectangular shape 2 x 16 inches; this affords a better protection against the teeth and feet of animals, and against raising caused by frost.

For pines and spruce it is usually necessary to use from 0.15 to 0.9 lbs. per acre, and the total cost of sowing varies from $2 to $5 per acre.

Sowing broadcast and sowing in lines have also been tried, but, as they do not give better results than sowing in holes, and are much more expensive, they have hardly been adopted.

As sowing in holes, when properly carried out, gives very satisfactory plantations and at the same time, is cheap, it is usually preferred to planting, which is more expensive. Preference is, however, given to planting: on dry ground exposed to the sun and wind, where vegetation is very thick, or where there is danger that the young seedlings may be deplaced by frost. On the other hand, planting is also practised to improve insufficient self-sowing or artificial sowing which has done badly, and to propagate spruce in the centre and the south of Sweden.

Nearly all the planting methods common in central Europe and in France have been tested in Sweden, and, as many of them were found suitable, it was unnecessary to experiment on special methods for Sweden. Pines are usually put in the ground when 2 or 3 years old, spruce when 2, 3 or 4 years old.

In intensive forestry the growth of plantations of a certain size is facilitated by removing undesirable self-sown trees, such as birch, alder, aspen, etc., by cutting the excessively luxuriant growth which covers the ground, by clearing the plantations by the removal of plants harmful to their neighbours, and which, at an early date, show unsatisfactory progress.

Attempts have been made to determine whether the annual felling in Sweden is equal or inferior to the annual growth by calculating the annual yield with the total annual consumption (in the country and exported). In this way it has been estimated that the total annual consumption of

timber amounts to 1,329,000,000 cubic feet, while the total annual production is 1,236,000,000 cubic feet, the excess of felling over growth being thus 93,000,000 cubic feet.

There is, therefore, no need to fear a failure or necessary decrease in the amount of raw material supplied to the timber trade which is of such great commercial importance to Sweden. On the one hand, the production of the forests can surely be increased, on the other hand, it is possible to reduce very considerably the wood requirements of the country. As the means of communication in the north of Sweden increase and improve, greater and greater stretches of woodland may be subjected to rational forestry methods, so that, not only will growth be increased, but it will be possible to utilize trees hitherto unsaleable. The continual rise in the price of wood would nesessitate a restriction of its use, which, up to the present, has been excessive On the other hand, in the manufacture of iron, part of the charcoal used is being gradually replaced by "white-coal" (electricity produced by water-power). These two means of economy will together place a considerable amount of wood at the disposition of the export trade, so that the development of this trade, which has hitherto been so rapid and so advantageous to Sweden, may be assured in the future.

The State Forestry Research Station was founded in 1902. In 1913 it had an income of 62,400 crowns. In 1915 it moved into large premises close to the Experimentalfaltet, near Stockholm. This station, which includes a forestry department and a scientific department, is under the same management as the High School for Forestry. The results of its work are published in the "*Communications of the State Forestry Research Station*," of which, up to 1916 12 volumes amounting to 2500 pages had appeared. It also publishes pamphlets or short papers on special subjects.

In 1916, a special sub-department was founded to study certain questions bearing on regeneration in the forests of Norrland. The work is to extend over 15 years, and the expenses are estimated at 230,000 crowns ($61,640).

Up till quite recently the State forestry schools were the *Institute of Forestry*, founded in 1828 to train administrative officials, and the *Schools of Forestry*, where supervisors were trained.

Later in 1912, it was decided to change the Institute of Forestry into the *High School for Forestry*, which, besides training administrative officials, should also study the development of rational forestry science. It holds: (a) a "Iagmastare" (rangers or conservators) course, preceded by a preparatory course; (b) a course for training agents for private forestry (conservators).

The *Forestry Schools*, seven in number, are divided among the various districts of Sweden. Each is administered by a director, aided by a forest guard, who also controls the State forests set apart for the instruction of students.

Each school usually has 20 pupils, all of whom receive free instruction and board, and about half of whom also hold studentships of 250 crowns ($67).

The courses, which last from the 1st October to the 15th September of the following year, aim at giving the students:— (a) the scientific knowledge which forms the basis of forestry; (b) skill in the most important forest work; (c) the ability to direct this work.

1030—**Nursery Practice in the National Forests of the United States.**—TILLOTSON, C. R., in *United States Department of Agriculture Bulletin* No. 479, *Contribution from the Forest Service, Professional Paper*, 86 pp. Washington, 1917.

Each year about 10 million forest-tree seedlings or transplants are required for the reforestation operations in the National Forests of the United States. The paper analysed gives the rules to be followed in order to keep forest-tree nurseries in a good condition and to produce plants of suitable size and species, of superior quality and ready to be supplied when required. The writer first describes the factors influencing the selection of a nursery site, and passes on to the questions of the size and arrangement of nurseries—outfit, nursery operations, packing and shipping, diseases and injuries, use of fertilizers.

He finally deals with the cost operations and gives the following figures showing some of the actual costs of past nursery operations.

	Cost per thousand
Growing 1 year stock	$0.33— $1.50
Care of 2 year stock	0.06— 0.50
Transplanting stock	0.77— 2.04
Care of transplants first year	0.18— 1.03
Digging, packing and shipping of stock	0.74— 2.43

1031—**The Utilisation of Ash in the United States.**—STERRETT, W. D., in *United States Department of Agriculture, Bulletin* No. 523, *Contribution from the Forest Service, Professional Paper*, p. 52. Washington, D.C., June 29, 1917.

Ash is one of the leading commercial hardwoods of the United States. Its importance is due to the intrinsic qualities of the wood, for the quantity cut annually, which is from 200 to 300 million feet, amounts to from 2.5 to 3 per cent, of the hardwood lumber output, and to less than 1 per cent. of the total cut of all species.

The bulletin analysed deals with the use of the different species of American ash, and indicates the methods by which owners may utilize their ash timber profitably.

It also gives an account of the properties of ash wood.

There are 18 species of ash native to the United States, but 98 per cent. of the ash lumber produced is from 3 species: white ash (*Fraxinus americana* L.), black ash (*F. nigra* Marsh), and green ash (*F. pennsylvanica*, var. *lanceolata* Sarg.). The species making up the remaining 2 per cent are Oregon ash (*F. oregona* Nutt.), blue ash (*F. quadrangulata* Mich.), Biltmore ash (*F. biltmoreana* Beadl.), pumpkin ash (*F. profunda* Bush.), and red ash (*F. pennsylvanica* Marsh.). All these species have good cultural possibilities and are considered more important silviculturally than commercially.

Ash is the second most important wood used in aeroplanes. The great bulk of the wood used for this purpose in the United States in spruce, but ash is especially suited for propeller blades, either alone, or in combination with other woods. American ash has supplanted European ash (from the Baltic region) in English shipbuilding (rafters, oars, capstans, bars, etc.). Export dealers pay from $30 to $40 per 1000 board ft.

Ash timber is extremely valuable for special uses and a number of articles (handles, butter tubs, vehicles and refrigerators) are made of it. As the supply of standing ash timber is becoming limited, the commercial growing of this tree is necessary to provide for future demands.

LIVE STOCK AND BREEDING

1032—Studies in Forage Poisoning.—GRAHAM, R., and HIMMELBERGER, L. R., in *Journal of the American Veterinary Medical Association*, Vol. LI, No. 2, pp. 164-187. Ithaca, N.Y., May 1917.

During the course of experimental studies in connection with a definite outbreak of forage poisoning, wherein an oat hay proved to be quite uniformly poisonous to horses and mules, various types of microorganisms were isolated from the forage. A spore forming, Gram negative, aerobic bacillus, designated in this paper as 0-1 and 0-1 culture, proved to be pathogenic when administered to horses and mules, less so for cattle, sheep and goats, while guinea pigs, rabbits and white mice were apparently immune. A bacillus possessing characters similar to 0-1 designated in this paper as N-1 and N-1 culture, was isolated from a silage in a remote outbreak of forage poisoning among cattle.

It is contributive to the writers' knowledge of this outbreak that sterile filtrates of the bacillus described in this paper, subsequent to daily intravenous injection in some experimental horses, proved pathogenic and capable of exciting clinical manifestations somewhat analogous to those in animals originally affected as the result of feeding on the oat hay, i.e., increased respiration, partial paresis of the pharyngeal muscles and the muscles of the intestinal wall, incoordination, prostration and death. Some literature regarding the etiology of forage poisoning is quoted.

1033—Sheep poisoned by Western Golden-Rod (Solidago spectabilis), in U.S.A.—LOCKETT, S., in the *Journal of the American Veterinary Medical Association*, Vol. 51, No. 2, pp. 214-221. Ithaca, N.Y., May, 1917.

It would appear from this brief study that western golden-rod (*Solidago spectabilis*), a forage plant sometimes found in sheep-pastures in the west of the United States, possesses definite nerve-poisoning properties, both in its natural green condition and when cured in hay. The symptoms produced by this plant in sheep which have eaten it may be acute, subacute or chronic, according to the amount eaten. Five hundred grammes, eaten in 8 hours, produced, within 23 hours, a severe type of poisoning in a 6 to 7 months lamb. Suitable doses of chloral hydrate seem to be an efficacious antidote. Strychnine sulphate, although not tested by the author, seems to be suitable for chronic cases.

1036—Rinderpest in Swine; Experiments upon its Transmission from Cattle and Carabaos to Swine and Vice Versa.—BOYNTON, WILLIAM HUTCHINS, in *Philippine Agricultural Review*, No. 9, p. 288. Manila, September 1916: reproduced in: *The Philippine Journal of Science*, Vol. XI, Sect. B., No. 5, pp. 215-265. Manila, September 1916. (2 pp. in Institute Bulletin).

1038—Some Aspects of the Physiology of Mammary Secretion.—HILL, REUBEN I., in *Journal of the American Veterinary Medical Association*, Vol. LI, No. 5, pp. 642-654. Ithaca, N.Y., August 1917.

1039—Utilisation of Farm Wastes in Feeding Live-Stock in the United States.—RAY, S. H., in *United States Department of Agriculture, Farmers' Bulletin* No. 873. Washington, D.C., August 1917.

The unprecedented demand for grain for human consumption makes it imperative

that only those feeds be used for live stock which are not needed for human food.

More than one-third of the total production of grain straw in the United States is not being used to advantage and, of this amount, one half is an absolute loss. Of the 245 million tons of corn stover produced annually in the United States it is estimated that only 81.5% is fed to stock and that at least 35% of this amount is lost through wasteful methods of feeding.

During the past years large quantities of cottonseed meal have been used for direct fertilizing, six of the Southeastern States having used in 1914 nearly 1 million tons for such purposes. This meal is worth from $30 to $40 a ton for feeding cattle, and about 25% of its fertilizing value is lost when it is so used.

This bulletin indicates methods whereby these wastes may be eliminated, the herds and flocks economically maintained, and the amount of grain used for the feeding of live stock reduced to the minimum.

1041—**Selecting Dairy Bulls by Performance.**—CARROLL, W. E., in *Utah Agricultural College Experiment Station Bulletin* 153, pp. 1-20. Logan, Utah, April 1917. (2 pp. in Institute Bulletin).

1043—**Silage for Beef Production.**—STARR, CH. G., in *The Breeders' Gazette*, Vol. LXXII, No. 11, p. 374. Chicago, September 13, 1917. (2 pp. in Institute Bulletin).

1045—**The Outlook for Farm Sheep Raising in the United States.**—MARSHALL, F. R., and MILLIN, R. B., in *Farmers' Bulletin* No. 840 *of the United States Department of Agriculture*, p. 1-24. Washington, D.C., July 1917. (2 pp. in Institute Bulletin).

1046—**The Model Garbage-Disposal Piggery belonging to Worcester, Massachusetts, U.S.A.**—BONNET, FREDERIC, JR., in *Engineering News-Record*, Vol. 79, No. 9, pp. 396-400. New York, August 30, 1917. (2 pp. in Institute Bulletin).

1047—**Protein Feeds for Laying Hens.**—KEMPSTER, H. L., in *University of Missouri College of Agriculture, Agricultural Station Circular* 82, pp. 1-12. Columbia, Missouri, June 1917.

1048—**The Feed Cost of Egg Production; Experiments in U.S.A.**—LAMON, H. M., and LEE, A. R., in *United States Department of Agriculture, Bulletin* No. 561, pp. 42. Washington, D.C., August 18, 1917. (2 pp. in Institute Bulletin).

FARM ENGINEERING

1051—**Trials of Agricultural Tractors at Noisy-le-Grand, France, in 1917.**—RINGELMANN, MAX, in *Feuille d'Information du Ministère de l'Agriculture*, Year 22, No. 31, pp. 3-6. Paris, July 31, 1917.

Twenty-seven machines took part in the trials at Noisy-le-Grand, 7 being of French, 1 of Italian, and 15 of American construction.

The published report only deals with 9 tractors; the writer will shortly publish the results of the trials of the other machines.

1052—**The Annual Work of a Tractor in France.**—RINGELMANN, MAX, in *Bulletin de la Société d'encouragement pour l'Industrie Nationale*, Vol. 128, No. 4, pp. 126-129. Paris, July-August, 1917. (2 pp. in Institute Bulletin).

1053—**Internal Combustion Farm Drainage Machines.**—*Engineering*, Vol. CIV, No. 2696, p. 228 and pp. 237-238. London, August 31, 1917.

1054—**Harvesting with Tractors: Trials at Grignon, France, in 1917.**—BERTHAULT, P., in *Journal d'Agriculture pratique*, Year 81, No. 18, pp. 344-345. Paris, September 6, 1917.

1056—**The Ventilation of Hay-Ricks.**—MANRIN, G., in the *Journal d'Agriculture pratique*, Year 81, No. 18, p. 347. Paris, September 6, 1917.

1058—**Fuel Alcohol in Australia.**—*The Engineer*, Vol. CXXIV, No. 3222, pp. 278-279. London, September 28, 1917.

The Commonwealth Advisory Council of Science and Industry in Australia appointed a special Committee to investigate the whole question of alcohol and engines. The 1st report of this Committee deals with the construction of an alcohol engine, the supply of alcohol and the denaturation process.

Alcohol engines are already made in America, England, France, and particularly in Germany. Any petrol engine of the ordinary types can be run on alcohol without material change in its construction, but the consumption of fuel per brake H. P. is about 50 per cent greater than in the case of petrol. It appears, however, that the consumption of alcohol per brake H.P. in a specially designed alcohol engine will not exceed in volume the consumption of petrol in a petrol engine. The main alterations necessary in petrol engines to fit them to work on alcohol are: 1) an increased

compression; 2) a pre-heating of either the fuel, or the air, or the mixture of air and fuel; 3) an increase in the area of the fuel jets and fuel supply pipes. In order to start an alcohol engine, the carburetter must be pre-heated, or else a small amount of petrol used. When a temperature sufficient to vaporise the fuel is attained, the alcohol can be gradually turned into the carburetter and the pre-heating of the fuel maintained by the exhaust gases.

The advantages of alcohol are: the products of combustion are practically odourless and free from smoke; the risks in manipulation are much less than when petrol is employed; there are many theoretical chemical and physical reasons why alcohol should yield superior results; there is no danger of pre-ignition under high compression; alcohol is more homogeneous than other fuels; alcohol can be produced in largely increased quantities in Australia.

As alcohol is more efficient in engines of low piston speed and long stroke, the Committee have decided to devote their attention to the design and manufacture of stationary engines.

The problem of distribution of alcohol is not likely to be so serious in the case of stationary engines as for the general adoption of the spirit for motor cars.

The supply of alcohol is the most difficult question, for even if the whole available supply of molasses in Australia were used for distillation, only about 4 million gallons of alcohol could be produced per annum, whereas the annual importations of petrol are about 17 million gallons. About 50,000 tons of molasses are annually produced in Australia of which only a little more than 1/5 is now used for making alcohol. The price of methyl alcohol produced from molasses is about 42 cents per gallon. It appears unlikely that any considerable quantity of alcohol can be manufactured in Australia from either raw, or waste, substances such as waste wood, straw, or waste fruit; cereals or industrial plants such as potatoes and beets might, however, be used.

Various authorities have proposed that alcohol should be used as a fuel in admixture with other materials such as benzine, ether or acetylene. The main advantage from such an admixture would be that the existing types of engines could be started without difficulty. A new fuel called "Natalite" is formed by a patented process in which the ether and alcohol are manufactured together in the form of a mixture, thus obviating the necessity for first producing the alcohol, and then manufacturing the ether from it. The Committee are making enquiries with a view to the production in Australia of suitable materials to be used as an admixture with alcohol, and as to the efficiency of the various admixtures. The Committee suggest cooperation with the Imperial Motor Transport Council, London, for the purpose of obtaining a denaturant for alcohol which will be generally acceptable throughout the British Empire.

RURAL ECONOMICS

1061—**A Survey of Beet-Producing Districts in Minnesota.**—PECK, F. W., in *The University of Minnesota Agricultural Experiment Station, Bulletin* No. 154, pp. 1-36. University Farm, St. Paul, Minn. February, 1917. (3 pp. in Institute Bulletin).

AGRICULTURAL INDUSTRIES

1067—**The Degree of Bolting: Food Value and Digestibility of Bread, Better Utilisation of Wheat.**—1. LAPICQUE, LOUIS, in *Comptes rendus des Séances de l'Académie des Sciences*, Vol. 165, No. 13, pp. 413-415. Paris, September 24, 1917.—II. BERTRAND, GABRIEL, *Ibid.*, Vol. 165, No. 14, pp. 438-440. Paris, October 1, 1917. (2 pp. in Institute Bulletin).

1068—**Method for Estimating Bran in Flour and Bread.**—LEGENDRE, R., in *Annales des falsifications et des fraudes*, Year 10, Nos. 105-106, pp. 293-296. Paris, July-August, 1917.

1069—**The Use of Brewers' Yeast in Bread Making.**—BAKER, J., in the *Journal of the Society of Chemical Industry*, Vol. 36, No. 14, pp. 836-839. London, July 31, 1917, and in *Brasserie et Malterie*, Year 7, No. 13, pp. 198-203. Nancy, September 20, 1917.

1070—**The Use of Calcium Glucosates in Bread-Making.**—LE ROY, G. A., in

Comptes Rendus des Séances de l'Académie des Sciences, Vol. 165, No. 13, p. 416. Paris, September 24, 1917.

Calcium glucosates may advantageously be used in the place of lime-water in order to improve, from the point of view of taste, food value and keeping quality, bread made with flour of a high bolting percentage, such as the 85% flours compulsory in France at the present time.

The glucosates are prepared by the digestion, in the cold, of an aqueous solution of commercial glucose (free from the traces of arsenic sometimes found in these products) with milk of lime. After filtration a clear solution of glucosates is obtained which, according to the respective proportions used, contains 1 part of calcium to every 1 or 2 parts of glucose. As these solutions may be made fairly concentrated, they are easier to use in bread-making than lime-water, the aqueous solution of which can only contain about 1 gramme of calcium per litre.

In his experiments, the Author used for 100 kg. of 85% flour kneaded with the usual quantities of water, yeast and common salt, quantities of glucosate solution representing 100 grm. of glucose and 50 grm. of calcium. This corresponds to about 1 grm. of glucose and 0.5 grm. of calcium per kg. of bread made.

The bread thus made was of a better quality than that made with lime-water under the same conditions. Fermentation, which appears to be slightly retarded with lime-water, seems, on the contrary, to be accelerated by the glucosate.

1074—**The Sterilization of Milk by the Lecomte Method; Tests made in Holland.**—I. *In en Uitvoer*, Year 2, No. 30, pp. 646-647. Amsterdam, July 25, 1917.—II. *Nederlandsche Weekblad voor Guivelbereiding en Veeteelt*, Year 23, No. 19, p. 1 Doetlinchem, August 7, 1917.

1076—**Cooling Milk on the Farm.**—HUNZIKER, O. F., MILLS, H. C., and SWITZER, H. B., in *Indiana Station Bulletin* No. 188, pp. 1087-1118, figs. 16. Lafayette, Indiana, 1916: *Summarized in Experiment Station Record U. S. Department of Agriculture*, Vol. 35, No. 9, pp. 874-875. Washington, D.C., 1917.

1077—**Causes of Variation in Cream Tests.**—WIANCKO, T. A. F., in *The Agricultural Journal of the Department of Agriculture of Victoria, B.C.*, Vol. 2, No. 5, pp. 86, 95, 98. Victoria, British Columbia, July 1917. (4 pp. in Institute Bulletin).

1079—**Chemical Changes Observed in Silage in the United States.**—I. DOX, A. W., and PLAISANCE, G. P. in *The Journal of the American Chemical Society*, Vol. XXXIX, No. 9, pp. 2078-2087. Easton, Pa., September 1917.—II. PLAISANCE, G. P., (Id.). *Ibid.*, pp. 2087-2088.

1080—**Live Stock Market Review in the United States for 1916.**—NELSON, W. L., in *Missouri State Board of Agriculture, Monthly Bulletin*, Vol. XV, No. V, pp. 1-24. Columbia, Mo., May 1917.

PLANT DISEASES

1084—**Fungi, Insects and Animals Injurious to Cultivated Plants, Observed in Denmark in 1916.**—LIND, J., ROSTRUP, S., and KOLPIN, *R. F.*, in *Tidskrift for Planteavl*, Vol. 24, Pt. 2, pp. 229-254. Copenhagen, 1917. (2 pp. in Institute Bulletin).

1086—**Soil Fungi Injurious to Cultivated Plants in the New York Botanical Gardens.**—SEAVER, F. J., in *Journal of the New York Botanical Gardens*, Vol. XVIII, No. 212, pp. 186-188. Lancaster ter, Pa., 1917.

1087—**Over-Wintering of the Apple-Scab Fungus, Venturia inequalis, in Canada.**—FRASER, W. P., in *Science*, New Series, Vol. XLVI, No. 1186, pp. 280-282. Lancaster, Pa., 1917.

Though it is generally known that the scab disease of the apple caused by the fungus *Venturia inequalis* sometimes attacks the young twigs of susceptible varieties of the apple, yet not much has been published on this phase of the disease in North America.

Morse and Darrows have shown that the conidia of this fungus survived the winter on apple twigs and germinated readily in the spring. They found no evidence, however, that the mycelium exists during the winter as a living stroma and produces conidia in the spring. Wallace also reviews the literature on the persistence of the stroma on the twigs and the hibernation of the conidia, and is convinced that twig infection is not of common occurrence, and that the conidia cannot withstand winter temperatures.

The writer's attention was first called to scab disease on the young shoots of the apple in the autumn of 1915, when a number of badly diseased twigs of a McIntosh apple tree were sent for determination by Dr. E. W. Henderson, of Mansonville

(Quebec). The twigs were defoliated for several inches from the tips and the leaves that remained below showed a very severe attack of scab. The twigs were severely injured, many of them being in a dying condition. The bark was studded with the pustules of the scab disease and abundant conidia were present. Another collection was sent by Dr. Henderson a few weeks later, but many of the twigs were now dead and few conidia remained.

Another collection of diseased twigs was received about April 1, from Prof. Shaw, collected at Truro Agricultural College, N.S., also from a McIntosh tree. Many of these twigs were killed back several inches, while abundant pustules of the scab were present in both dead and living bark.

The affected twigs showed the characteristics described by Morse and Darrows. The bark was more or less thickly studded with light brown spots which examination showed to be blister-like areas due to the death and pushing out of the epidermis of the twigs. Many of these light-brown areas were roundish, or oval, with a dark centre. A number, however, lacked the dark central area. Pieces of the diseased bark were removed, embedded in paraffin, and sectioned, and the sections and diseased twigs examined. A well developed stroma was present, with many conidia beneath the raised epidermis. The dark centre was composed chiefly of the conidiophores of the fungus, the exposed conidia having fallen away.

Dr. Henderson and Prof. Shaw were asked to forward diseased twigs collected about blossoming time. The collection from Prof. Shaw was received about June 1st. A few inches of the tips of some of the twigs were dead, but the bark of the living parts and of the living twigs contained many scattered pustules of the apple-scab actively producing conidia, the pustules being olive-green from the abundant conidia. The dead parts of the twigs were thickly covered with scab pustules from the previous season, but the stroma were dead, or not producing conidia.

Fresh conidia, placed in hanging drops of distilled water, germinated as freely and vigorously as conidia obtained a short time later from the young leaves of an apple in the orchard. Pieces of the bark containing live pustules were fixed, embedded in paraffin, and sectioned. The stroma was very well developed, reaching a maximum thickness of 200 u, while the maximum thickness of the stroma on the fruit was about 55 u. It was also evident that the stroma was actively producing conidia at the time of fixation.

In 1915, Mr. A. G. Turney described the scab as being troublesome in the twigs of susceptible varieties, and states that in one orchard all the twigs of the previous year's growth of the Fameuse were covered with scab spots. He also found the amount of scab on the fruit was much reduced by trimming off the diseased twigs early in the spring. He had previously failed to control scab in this orchard by spraying. Mr Turney states, in a letter to the writer, that the scab is quite common in the coastal regions as a twig infestation, and it may be found also in almost any orchard inland, but rarely so bad as to be a serious hindrance to growth.

Prof. Shaw has informed the writer that he found severe twig injury from scab in several different regions in Nova Scotia. The twigs collected at Mansonville, Quebec, at blossoming time by Dr. Henderson did not show any living pustules, but as few of them had been cut back into the living wood, the negative evidence was not satisfactory.

The twigs that had been received from Truro, N.S., about April 1st were left about 8 weeks in the laboratory under ordinary conditions. Conidia were then taken from the scabbed areas and were tested in hanging drops of distilled water for germination. A small percentage was found to germinate. A second test gave the same result. The spores were taken from beneath the blistered bark, so that they had a certain amount of protection from the cold and from drying.

The writer is convinced from these experiments and observations that, in certain regions near the coast, apple scab may winter on the twigs of susceptible varieties such as "Fameuse" and McIntosh as a dormant stroma and produce abundant conidia in the spring. He also confirms Morse and Darrow's conclusion that, under certain conditions, and with certain varieties of apple, diseased twigs and rain may be an important factor in the propagation and spread of the disease.

J. S. Dash, who has devoted some time at Quebec to the study of apple scab, collected scabby apples early in the spring that had lain under the snow all the winter, and found that about 5 to 10 per cent of the conidia germinated.

On November 27, 1916, the writer collected scabby apples that had remained under the trees after their fall without protection of any kind. During late autumn, and early winter, the temperature fell below the freezing point 15 times, rising above it during the day.

There were 2 periods of severe frost followed by mild weather, the minimum temperature of the first being 11° F., and of the second (November 26) being 1° F. Conidia were abundant on the scab spots and these were placed in hanging drops of distilled water. The spores germinated vigorously and freely, and in 24 hours showed many germ tubes over 100 u in length.

More than 26 per cent of the conidia placed in hanging drops of distilled water

germinated. Only those with well-developed germ-tubes were counted. There could be no doubt whatever that the germ tubes had developed while in the water.

It would seem from these observations, that the conidia are more resistant to low temperatures than is generally supposed. The writer hopes to carry on further experiments along this line during the winter and spring.

1096—**Bacterium Pruni, Injurious to Peach and Plum Trees in the United States.**—ROBERTS, JOHN W., in *United States Department of Agriculture, Bulletin* 543, pp. 1-7. Washington, D.C., 1917.

INJURIOUS INSECTS

1108—**Mites Attacking Orchard and Field Crops in Utah, United States.**—DOANE, R. W., in *Science*, New Series, Vol. XLVI, No. 1182, p. 192. Lancaster, Pa., 1917.

During the summers of 1915 and 1916, certain mites were found to be particularly abundant and destructive to grain in Utah.

The most important of these was the common *Tetranychus bimaculatus* Harvey, Which Ewing believes to be the same as *T. telarius* Linn., which, as has already been pointed out, is an important pest on a surprisingly large number of crops. In 1916, it was so abundant in orchards that many cherry trees were completely defoliated before the end of August, and apricot, pear, plum and apple trees were only a little less seriously affected.

Raspberry and currant bushes suffered severely, some of them losing all their leaves.

Peas, beans, tomatoes and other kinds of kitchen-garden produce showed more or less injury in all stages of their development. In one field of sugar beets, the writer found many leaves drying and turning brown on account of the attacks of this mite.

The loss of the foliage of many ornamental plants, while not of so much economic importance, was very annoying.

Maize probably suffered more than any other field crop. In many fields practically every plant suffered the loss of some of its leaves, and in other places all the leaves turned brown and became thoroughly dry because of the presence of myriads of mites on their lower surfaces. The parts of the fields where the soil was lighter and drier usually suffered most, but no parts seemed to be immune from the attacks of this pest. The suckers and lower leaves were the first to be attacked and to show brown spots or streaks. When the trouble went no further it was of but little economic importance, but when the upper leaves were attacked and practically all destroyed, the plant withered and was not even good for fodder.

Many wheat fields also sustained considerable losses due to the attacks of the same mite. The wheat plants would be usually attacked a short time before the head burst from beneath the sheath, and when the infestation was bad, the leaves would become dry and brown at the point of attack and the portion of the leaf beyond this would droop and dry out. Often all the leaves were affected in this way, and the heads, if they developed at all, were small and poorly filled.

Earlier in the season, while the wheat plants were much smaller, they were often attacked by two other species of mite. One of these is the well-known clover mite, *Bryobia pratensis*, while the other, which is known as the jumping mite, was first named *Tetranychus longipes* by Banks who now places it with two others in a new genus, *Tetranobia*.

In fields where *T. longipes* is abundant, the leaves turn distinctly grey, and many of them become so dry, that the growth of the plant is seriously affected.

Both *B. pratensis* and *Tetranobia longipes* were found destructively abundant not only on wheat, but on barley, oats, and many wild grasses.

THE CALIFORNIA FEDERATION OF FARMERS' CO-OPERATIVE MARKETING ASSOCIATIONS

At a metting held last October in the offices of the State Market Director in San Francisco the final organization was effected of the California Federation of Farmers' Co-operative Marketing Associations. The associations which joined it were the California Prune and Apricot Growers, the California Associated Olive Growers, the California Peach Growers, the California Associated Raisin Company, the Central California Berry-growers' Association, the Sebastopol Apple Growers'

Union, the Poultry Producers of Central California and the Poultry Producers of Southern California. Several associations are still considering the advisability of joining and it is expected that some of them will decide in favour of doing so. They are the Rice Association, the Dairy Association, the Almond Exchange, the Walnut Association, the California Fruit Exchange and the California Fruit Growers' Exchange. The Market Director states that the Citrus Exchange wishes to keep in touch with the federation but to remain outside it for the present.

The Market Director intimates that the following are the objects of the federation, which is managed by an executive committee:

"To secure co-operation on all problems of common interest.

"To secure an interchange of thoughts, ideas and experiences.

"To secure collective data on forms of organization and the dissemination of information relative to laws proposed and adopted, opinions and judgments of courts, commissions and tribunals involving the scope and limitation of the activities of co-operative marketing associations.

"To develop plans for the further elimination of waste in the cost of distribution of products.

"The joint employment of brokers or salaried agents at Eastern marketing points.

"The joint employment of an all-year-round sales organization for the American home markets for the various California farm products, in their respective seasons, to be handled through the established channels or otherwise.

"The joint employment of demonstration organizations to aid, encourage and educate the retail dealers throughout the country to specialize on California food products.

"Joint effort in national publicity and educational advertising.

"Development of foreign markets by the joint creation of foreign-sales organizations.

"To suggest and carry out plans for more favourable State and Federal legislation in the proper interest of California farm products.

"Favourable Federal tariffs affecting California farm products and joint opposition against the enactment of possible harmful or unfair tariffs.

"To develop plans for the collective purchase and production of supplies used by all or several of the associations.

"To develop plans for co-operation in securing proper transportation and proper transportation rates and facilities.

"To develop plans for securing financial accommodations in the primary financial markets at the lowest possible interest rates.

"To develop plans for creating and maintaining a labour bureau or other methods for handling the labour problems of farmers and marketing associations.

"To suggest and do any and all proper things which, at any time or place, may be advantageous and beneficial to co-operative marketing associations in general and to the member associations in particular."

CONTENTS OF THE INSTITUTE ECONOMIC BULLETIN

In addition to those already dealt with herein, the following is a list of the more important subjects treated in the December number of the International Review of Agricultural Economics. Persons interested in any of the articles in this list may obtain the original Bulletin on application to the Institute Branch, so long as the supply for distribution is not exhausted:

AGRICULTURAL STATISTICS

CONDITION OF THE NEW CEREAL CROPS

According to the March number of the International Crop Report, the area sown to winter wheat was for the sum of the European countries brought under review, a greater one than in the previous season, and further that this increase is far from being negligible. In Denmark, where 141,000 acres were sown, the increase is 2.4 %, in France the increase is 7.5% or 790,000 acres, with an aggregate area of 11,359,000 acres winter sown in 1917. In England, Scotland and Luxemburg, with areas of much less importance, the additions were respectively 15%, 21.8%, and 4.8%. Spain is alone in reporting a decrease; the winter sowings have taken place on an area of 9,672,000 acres, which is less by 5.6% or 573,000 acres than the corresponding area in the previous year.

In Asia, winter sowings were considerably larger. In British India they took place over an extent of 33,911,000 acres as regards wheat, against 30,924,000 acres in the previous year, affording an increase of 9.7%. In Japan the advance was 18% with an area of 1,457,000 acres of winter wheat. Finally in Tunis the increase reaches 13.2%, winter wheat being sown on 1,483,000 acres as compared with 1,310,000 in 1916-17.

As regards crop conditions, speaking generally, it may be affirmed that the season has been favourable so far, having been noted for fine dry and mostly mild weather. According to the reports furnished by the various agricultural administrations with respect to the state of the crops on March 1st and February 1st, 1918, they were good in Spain, France and Great Britain, fairly good in Switzerland, average in Ireland, Italy and Egypt and poor in Japan.

This bulletin also includes the latest information to hand as regards the crops of 1917-18 in the Southern hemisphere. The wheat crop of Uruguay is now estimated at 12,861,000 bushels or 238.6% of the crop of 1916-17, an increase of 7,450,000 bushels, and 191.6% of the average (1911-12 to 1915-16), an increase of 6,150,000 bushels. The Australian wheat crop is estimated at 122,586,000 bushels, or 80.6% of the crop 1916-17, a decrease of 30,000,000 bushels, and 130.0% of the average yield, an increase of 28,000,000.

CROP PROSPECTS IN THE UNITED KINGDOM

(Summarized from "The Statist", London, April 6th.)

Some preliminary official observations as to agricultural conditions and prospects in the United Kingdom were recently issued. The weather has generally been fine, though rain was somewhat too plentiful in many districts in the North of England. The mildness of February induced many farmers to plough more land than usual, since the ground was not in the wet, saggy condition usual at that time of the year. Agricultural labour has been very scarce, particularly on this side of the Channel, and it was very difficult to get land turned early.

The crop reporters indicate that the area under winter wheat will probably show an improvement. The mild weather of the last few months has been favourable to condition. Winter wheat seems to have been put in on a more extensive scale than hitherto in Ireland. In some places fear is expressed that it has developed too rapidly and is now too forward for the time of the year. Taken all around, conditions are much better than at this period last year, when the prolonged frosts and snows had inflicted much damage to the crop.

Spring-sown wheat and oats are more common in the British Isles, and the sowings are usually completed by the end of March or of the first fortnight in April. The weather for the past few weeks has been very propitious for making seed-beds, as it was possible to work the soil thoroughly. The alternation of rain and sunshine provided the moisture and the warmth which are necessary to successful germination. Farmers who have planted their seed in ground that has been at all well prepared should receive a bumper return if all goes well between now and the harvest. It is not at present possible to estimate the area under the different crops, wheat, oats, and barley, but reports from most districts indicate that they will show an increase at the expense of the area under clovers and rotatory grasses. In many cases a second cereal crop is being sown, and it is here that we see the strongest justification for the insistence of the Boards of Agriculture on the breaking up even of fine-quality pasture land.

The recent news in regard to conditions in agricultural Russia is particularly bad. According to the Central Committee of Economic Organization, set up by the present Russian Government, the disturbances following on the political upheaval have been so severe and widespread that the total crop area this year will be only 30% of the average.

UNITED STATES APRIL CROP REPORT

According to the April report of the United States Department of Agriculture winter wheat production in the United States this year will be about 560,000,000 bushels. The forecast indicates an increase of 142,000,000 bushels of winter wheat over last year's winter crop, which was 418,000,000 bushels. Assuming the spring wheat crop will yield the same ratio of increase, there will be a total crop of 850,000,000, or an increase of about 200,000,000 bushels over last year, when the entire crop w s estimated at 651,000,000. The condition of the crop on April 1st was 78.6% of a normal.

Rye acreage last autumn showed a 36 per cent increase over the previous year, with 6,119,000 acres planted. The condition of the crop on April 1st was 85.8 per cent of a normal and the forecast of production made at that time was 86,000,000 bushels. Last year's production was 60,145,000 bushels. This is an increase of 26,000,000 in the prospective rye crop, making a total prospective increase over last year of about 225,000,000 bushels of bread grains.

BROMHALL'S FOREIGN CROP CABLE, APRIL 16TH

United Kingdom.—Weather has been good and winter crops as a result have been making rapid progress with conditions very favourable. Sowing continues on an enlarged scale, and much spring corn has already been seeded. Farmers are also busy with barley and oats. Native offerings are gradually increasing.

Scandinavian Countries.—Crop conditions fair and weather is now more favourable. Supplies are very moderate and arrivals of foreign sorts small.

Algeria.—Weather has been cold and dry, but the crop outlook is fair and a good area has been planted. Recent rains have been reported, and these will be very beneficial.

Balkan States.—Reports are good and weather continues favourable. Sowing of corn is under way, with prospects maintained and outlook satisfactory.

Russia.—Weather is still reported as being cold, which is having a tendency to retard sowing operations. Prospects are unsatisfactory. Crop advices are conflicting.

Italy.—Crop conditions continue to be reported as favourable with weather good. Some coldness, and rain were experienced, but this did no damage, and the young crops present a very favourable appearance. It is expected that the spring wheat acreage will be larger. Supplies are more or less scanty, but the outlook is more hopeful.

Spain.—Weather conditions are said to be generally favourable for crops as fair rains have been reported, which were beneficial. Supplies are coming forward more regularly.

North Africa.—Prospects are now generally favourable as a result of good precipitation.

PUBLICATIONS WANTED

The International Institute Library, Dept. of Agriculture, Ottawa, Canada, requires the following publications to complete files. Donations of any of them will be much appreciated.

B. C. Dept. of Agriculture, Bulletins 1 to 6, 9, 10, 13 to 19, 23, 47.

B. C. Dept. of Agriculture, Agricultural Department Circular 3.

B. C. Dept. of Agriculture, Live Stock Branch, Circular bulletins 9, 16, 17.

Canada, Health of Animals Branch, Farmers' Bulletins 3 & 6 (1899).

N. B. Dept. of Agriculture, Soils and Crops Div. Leaflet 1; Soils and Crops Div. Circs. 1 & 2; Horticultural Div. Bulletin 1.

N. S. Dept. of Agriculture, Bulletins 1 & 2.

Ontario Agricultural College, Bulletins 1-99.

Saskatchewan, Dept. of Agriculture, Bulletins 1, 3, 4, 5, 8.

International Agricultural Institute, Bulletin des renseignements agricoles et des maladies des plantes, Nov. & Dec. 1910 (French edition).

International Agricultural Institute, Bulletin des institutions économiques et sociales, Dec. 1910 (French edition).

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